LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. B. Sreenivasa Reddy
Course Name & Code : PC-II, 20FE02
L-T-P Structure : **2-0-0** **Credits:** 02
Program/Sem/Sec : CSE –A- II SEM
A.Y. : 2021-22

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
CO5	Write well structured essays; Reports &Résumé.	L3

UNIT-I

Fabric of Change-'H.G. Wells and the Uncertainties of Progress–Peter J. Bowler'; Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary**:** Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting; Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';

Reading: Global Comprehension; Detailed Comprehension; Grammar & Vocabulary**:** Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays using suitable claims and evidences.

UNIT-III

'Homi Jahangir Bhabha'; Grammar & Vocabulary: Words often confused; Common Errors; Writing**:** Incident & Investigation Reports.

UNIT-IV

'Jagadish Chandra Bose'; Grammar & Vocabulary: Use of antonyms; Correction of Sentences; Writing**:** Dialogue Writing.

UNIT-V

'**Prafulla Chandra Ray'**; Grammar & Vocabulary: Analogy; Sentence Completion; Writing**:** Writing a Résumé

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1		1		1			3	3		2			
CO2		1		1		1			3	3		2			
CO3		1		1		1			3	3		2			
CO4		1		1		1			3	3		2			
CO5		1		1		1			3	3		2			
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1 Prabhavati. Y & etal , "English All Round –Communication Skills for Undergraduate Learners" ,Orient Black Swan, Hyderabad, 2019

T2 "The Great Indian Scientists" published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

R1 Swan, M., "Practical English Usage", Oxford University Press, 2016.

R2 Kumar, Sand Latha, P, "Communication Skills", Oxford University Press, 2018.

R3 Rizvi Ashraf M.,"Effective Technical Communication", Tata Mc Graw Hill, NewDelhi, 2008.

R4 Baradwaj Kumkum, "Professional Communication",I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.

R5 Wood, F. T., "Remedial English Grammar" , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	02-05-2022		TLM2	
2.	**Fabric of Change-**'H.G. Wells and the Uncertainties of Progress–Peter J. Bowler'	01	07-05-2022		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	09-05-2022		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	14-05-2022		TLM2	
5.	Adjectives and adverbs	01	16-05-2022		TLM2	
6.	Degrees of Comparison	01	21-05-2022		TLM2	
7.	Writing: Information Transfer.	01	23-05-2022		TLM2 TLM6	
No. of classes required to complete UNIT-I: 07				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	**Tools for Life -** 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';	01	28-05--2022		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	30-05-20222		TLM2	
10.	Active & Passive Voice	01	04-06-2022		TLM2	
11.	Idioms & Phrases	01	06-06-20222		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	01	11-06-2022		TLM2 TLM6	
No. of classes required to complete UNIT-II: 05				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	**'Homi Jahangir Bhabha'**	02	13-06-2022		TLM2 TLM6	
14.	Words often confused	01	18-06-2022		TLM2	
15.	Common Errors	01	27-06-2022		TLM2	
16.	Report Writing – Types & Formats	01	02-07-2022		TLM2	
17.	Incident and Investigation Reports	01	04-07-2022		TLM2 TLM6	
No. of classes required to complete UNIT-III: 06				**No. of classes taken:**		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	**Jagadish Chandra Bose**	01	09-07-2022		TLM2 TLM2	
19.	Use of antonyms	01	11-07-20222		TLM2	
20.	Correction of Sentences	01	16-07-2022		TLM2	
21.	Formal and Informal dialogues	01	18-07-2022		TLM2	
22.	Dialogue Writing.	01	23-07-20222		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 05				**No. of classes taken:**		

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	**Prafulla Chandra Ray**	01	25-07-2022		TLM2	
24.	**Prafulla Chandra Ray**	01	30-07-2022			
25.	Analogy	01	01-08-2022		TLM2	
26.	Sentence Completion	01	06-08-2022		TLM2	
27.	Resume - Formats	01	08-08-2022		TLM2	
28.	Writing a Résumé	01	13-8-2022		TLM2 TLM6	
No. of classes required to complete UNIT-V: 05				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	B. Sreenivasa Reddy	Dr. B. Samrajya Lakshmi	Dr. B. Samrajya Lakshmi	Dr. A. Ramireddy
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM/SEM/SEC : I B. Tech., II-Sem., CSE - A
ACADEMIC YEAR : 2021-22
COURSE NAME & CODE : Linear algebra & Transformation Techniques&20FE04
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. A. Rami Reddy.
COURSE COORDINATOR : Dr. K. Jhansi Rani
PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (Apply L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO2	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO3	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO4	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO5	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
1 - Low					**2** –Medium						**3** - High				

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, " Elementary Differential Equations" , 7th Edition, John Wiley & sons, New Delhi,2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	02/05/22		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to the course, Course Outcomes	1	04/05/22		TLM1	
3.	Introduction to UNIT I	1	06/05/22		TLM2	
4.	Echelon form of a matrix	1	07/05/22		TLM1	
5.	Normal form of a matrix	1	09/05/22		TLM1	
6.	Normal form of a matrix	1	11/05/22		TLM1	
7.	PAQ form	1	13/05/22		TLM1	
8.	Solution of Homogeneous linear system of equations	1	14/05/22		TLM1	
9.	Solution of Non homogeneous Linear system of equations	1	16/05/22		TLM1	
10.	Solution of Non homogeneous Linear system of equations	1	18/05/22		TLM1	
11.	**Tutorial 1**	1	20/05/22		TLM3	
12.	Solution of homogeneous Linear system of equations	1	21/05/22		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	23/05/22		TLM2	
14.	Eigen values of a matrix	1	25/05/22		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	27/05/22		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	28/05/22		TLM1	
17.	Properties	1	30/05/22		TLM1	
18.	Properties	1	01/06/22		TLM1	
19.	Cayley – Hamilton Theorem.	1	03/06/22		TLM1	
20.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	04/06/22		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	06/06/22		TLM1	
22.	**Tutorial 2**	1	08/06/22		TLM3	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	10/06/22		TLM2	
24.	Standard forms of Laplace Transforms.	1	11/06/22		TLM1	
25.	Linear Property, Shifting Theorem.	1	13/06/22		TLM1	
26.	Change of scale property, Multiplication by t.	1	15/06/22		TLM1	
27.	Multiplication by t.	1	17/06/22		TLM1	
28.	Revision	1	18/06/22		TLM1	
II MID EXAMINATIONS (20-06-2022 TO 25-06-2022)						

29.	Division by t	1	27/06/22		TLM1	
30.	Laplace transforms of derivatives.	1	29/06/22		TLM 1	
31.	Laplace transforms of Integrals.	1	01/07/22		TLM1	
32.	**Tutorial 3**	1	02/07/22		TLM3	
33.	Unit step function and Dirac's delta function.	1	04/07/22		TLM1	
34.	Application of Laplace Transforms.	1	06/07/22		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to UNIT IV.	1	08/07/22		TLM2	
36.	Linear property.	1	09/07/22		TLM1	
37.	Shifting properties.	1	11/07/22		TLM1	
38.	Inverse Laplace transform by using partial fractions.	1	13/07/22		TLM1	
39.	Inverse Laplace transform by using partial fractions.	1	15/07/22		TLM1	
40.	Inverse Laplace Transform by using Convolution theorem.	1	16/07/22		TLM1	
41.	Inverse Laplace Transform by using Convolution theorem.	1	18/07/22		TLM1	
42.	Solving of Ordinary differential equation by Laplace transform method.	1	20/07/22		TLM1	
43.	Solving of Ordinary differential equation by Laplace transform method.	1	22/07/22		TLM1	
44.	**Tutorial 4**	1	23/07/22		TLM3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Introduction to UNIT V.	1	25/07/22		TLM1	
46.	Standard forms of Z- Transform.	1	27/07/22		TLM1	
47.	Damping rule	1	29/07/22		TLM1	
48.	Shifting Rule	1	30/07/22		TLM1	
49.	Initial and final value theorems	1	01/08/22		TLM1	
50.	Inverse Z – Transfroms by using partial fractions.	1	03/08/22		TLM1	
51.	Inverse Z – Transforms by using convolution theorem.	1	05/08/22		TLM1	
52.	Solving of Difference equations by using Z – Transforms.	1	06/08/22		TLM1	
53.	Solving of Difference equations by using Z – Transforms.	1	10/08/22		TLM1	
54.	**Tutorial 5**	1	12/08/22		TLM3	
No. of classes required to complete UNIT-V:10				**No. of classes taken:**		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Solving of PDE other methods	1	13/08/22		TLM3	

II MID EXAMINATIONS (15-08-2022 TO 20-08-2022)

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. A. Rami Reddy**	**Dr. K. Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.S.Vijaya Dasaradha
Course Name & Code **:** Engineering Chemistry & 20FE06
L-T-P Structure **: 3-0-0** **Credits :03**
Program/Sem/Sec : B.Tech/II-sem/CSE- A **A.Y.** **:** 2021-22

Pre-requisites: Nil
Course Educational Objectives: It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques.

COURSE OUTCOMES (COs): After completion of the course, students will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications (L3)
CO2	Apply principles of corrosion for design and effective maintenance of various equipment. (L3)
CO3	Analyze the suitability of advanced materials like nano-materials in electronics and medicine (L4)
CO4	Identify the importance of liquid crystals, polymers in advanced technologies (L2)
CO5	Apply the principles of analytical techniques in chemical analysis (L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	2	-	-	-	-	2
CO2	3	2	2	1	-	2	1	-	-	-	-	2
CO3	3	2	2	1	-	1	1	-	-	-	-	2
CO4	3	2	2	1	-	1	1	-	-	-	-	2
CO5	3	2	1	1	-	1	1	-	-	-	-	2
1 = Slight (Low) **2 = Moderate (Medium)** **3 = Substantial (High)**												

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 Shikha Agarwal, "A Text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015

T2 Jain, Jain, "A textbook of Engineering Chemistry", Dhanpat Rai Publishing Company, New l 16th Edition, 2015.

BOS APPROVED REFERENCE BOOKS:

R1 Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, Delhi, 3rd Edition, 2003.

R2 S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010

R3 Prasanta Rath, B. Rama Devi, Ch. Venkata Ramana Reddy, Subhendu Chakroborty, "Engineering Chemistry", Cengage Learning India, 1st Edition, 2019.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ELECTRO CHEMISTRY & BATTERIES

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to Course and COs	1	04-05-2022		TLM1	
2	Prerequisites for Unit-I	1	05-05-2022		TLM1	
3	Applications of Electro-chemical Series	1	07-05-2022		TLM1	
4	Calculation of EMF of Cell	1	10-05-2022		TLM1	
5	Practice exercises on applications of Electro chemical series	1	11-05-2022		TLM1	
6	Glass Electrode	1	12-05-2022		TLM1	
7	Calomel Electrode	1	14-05-2022		TLM1	
8	Applications of Nernst Equation	1	17-05-2022		TLM3	
9	Lead-acid Battery	1	18-05-2022		TLM1	
10	Lithium-ion Battery, Mg-Cu Reserve Battery	1	19-05-2022		TLM1	
11	$H_2 - O_2$ Fuel cell	1	21-05-2022		TLM1	
12	Revision of Unit 1, Assignment & Quiz	1	24-05-2022		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: SCIENCE OF CORROSION

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Definition, Examples, Dry corrosion	1	25-05-2022		TLM1	
2	Corrosion by other gases and liquid metal corrosion	1	26-05-2022		TLM1	
3	Contd.. Dry corrosion, pilling bed worth rule, Conditions for wet corrosion	1	28-05-2022		TLM1	
4	Mechanism- oxygen absorption, hydrogen evolution, types of wet corrosion	1	31-05-2022		TLM1	
5	Galvanic Corrosion, passivity and Galvanic series	1	01-06-2022		TLM1	
6	Concentration Cell Corrosion	1	02-06-2022		TLM1	
7	Nature of metal, Nature of environment	1	04-06-2022		TLM1	
8	Cathodic Protection	1	07-06-2022		TLM1	
9	Electroplating, metal cladding.	1	08-06-2022		TLM1	
10	Revision of Unit II, Assignment & Quiz	1	09-06-2022 & 11-06-22		TLM1	
No. of classes required to complete UNIT-II: 11				**No. of classes taken:**		

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction, types of nano-materials, ,	1	14-06-2022		TLM1	
2	Gas-Phase Synthesis of nanomaterials	1	15-06-2022		TLM1	
3	Applications of nano materials	1	16-06-2022		TLM2	
4	Materials in Electronic devices.	1	18-06-2022		TLM1	
5	Contd.. Materials in Electronic devices	1	28-06-2022		TLM1	
6	Characteristics of Molecular motors and machines	1	29-06-2022		TLM2	
7	Characteristics of Molecular motors and machines	1	30-06-2022		TLM2	
8	Rotaxanes as artificial	1	02-07-2022		TLM1	

	molecular machines					
9	Catenanes as artificial molecular machines	1	05-07-2022		TLM2	
10	Automated light powered molecular motars	1	06-07-2022		TLM2	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV : LIQUID CRYSTALS & POLYMERS

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Classification of liquid crystals	1	07-07-2022		TLM1	
2	Mechanisim of working liquid crystals & their applications	1	09-07-2022		TLM1	
3	Introduction and types of polymerizations,	1	12-07-2022		TLM1	
4	Preparation, properties and engineering applications of P.M.M.A, Teflon	1	13-07-2022		TLM2	
5	Preparation properties and engineering applications of Polycarbonate, Structure of raw rubber and vulcanized rubber	1	14-07-2022		TLM1	
6	Preparation properties and engineering applications of Polyurethane, Buna-S	1	16-07-2022 & 19-07-2022		TLM1	
7	Conducting polymers	1	20-07-2022		TLM1	
8	Biodegradable polymers	1	21-07-2022		TLM1	
9	Revision of Unit IV, Assignment & Quiz	1	23-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V : ANALYTICAL TECHNIQUES

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Types of analysis	1	26-07-2022		TLM1	
2	Principle of conductometric titrations, Strong acid vs strong base titrations	1	27-07-2022		TLM1	
3	Strong acid vs weak base titrations, Strong base vs weak acid titrations	1	28-07-2022		TLM1	
4	Weak acid vs weak base	1	30-07-2022		TLM1	

	titrations					
5	Principle of potentiometry Acid-base titration	1	02-08-2022		TLM1	
6	Redox titration	1	03-08-2022		TLM1	
7	Colorimetry, Principle and determination of iron by using thiocynate as a reagent	1	04-08-2022 & 06-08-2022		TLM1	
8	Revision of Unit V	1	10-08-2022		TLM1	
9	**Assignment & Quiz**	1	11-08-2022		TLM1	
No. of classes required to complete UNIT-V: 9				**No. of classes taken:**		

CONTENTS BEYOND SYLLABUS						
1	Batteries used in mobile phones of popular companies	1	11-08-2022		TLM1	
2	Polymers in industrial applications	1	13-08-2022		TLM1	
3	Applications of electroplating with ref to PCBs	1	13-08-2022		TLM1	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.S.Vijaya Dasaradha**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Mekala Srinivasa Rao
Course Name & Code : Python Programming (20CS05)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech. – CSE / II Sem / A A.Y. : 2021 – 22

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	-	1	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO4	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO5	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
1 – Low						**2 –** Medium							**3 –** High		

TEXTBOOKS:

T1: Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford Publications

T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

R1: Gowrishankar S and Veena A, "Introduction to Python Programming", CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK

R2: R. Nageswara Rao, "Core python programming", Dreamtech, 2017.

R3: Y. Daniel Liang, "Revel for Introduction to Python Programming and Data Structures", Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	1	04/05/22			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	1	05/05/22			
3.	Python Built-in Types, Variables, Indentation	1	07/05/22			
4.	Input-Output Statements	1	10/05/22			
5.	Identifiers, Keywords, Literals, Simple Programs	1	11/05/22			
6.	Operators in Python	1	12/05/22			
7.	Operator Precedence, Programming Examples	1	14/05/22			
8.	Conditional Statements – if, if-else, Nested If-else	1	17/05/22			
9.	Python Loops – While loop, while loop with else, sample programs	1	18/05/22			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	19/05/22			
11.	Jumping Statements – continue, break, pass		21/05/22			
12.	Mathematical functions & constants, Random Number functions	1	24/05/22			
No. of classes required to complete UNIT – I: 12				**No. of classes taken:**		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	**List:** Basics of List, Creating and Accessing Elements	1	25/05/22			
14.	Updating Lists & Deleting Lists, Sample Programs	1	26/05/22			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	28/05/22			
16.	Operations on Matrices	1	31/05/22			
17.	Built-in List Functions	1	01/06/22			
18.	**Tuples:** Basics of Tuples, Creating and Deleting elements in a Tuple	1	02/06/22			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	04/06/22			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	07/06/22			
21.	**Sets:** Basics of Sets, Operations on sets, Sample Programs	1	08/06/22			
22.	**Dictionaries:** Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	09/06/22			
23.	Dictionary Properties & Functions	1	11/06/22			
No. of classes required to complete UNIT – II: 11				**No. of classes taken:**		

UNIT – III: Functions, Modular Design & Exception Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**Functions:** Basics of Function, Defining and Calling a function, Sample Programs	1	14/06/22			
25.	Types of functions, Function Arguments, Anonymous functions	1	15/06/22			
26.	Global and Local variables, Sample Programs	1	16/06/22			
27.	Recursion, Sample Programs	1	18/06/22			
28.	**Modular Design:** Introduction to Modules, creating a Module, import statement	1	28/06/22			
29.	from statement, Date and Time Module	1	29/06/22			
30.	Programs on Modules	1	30/06/22			
31.	Exception Handling: Basics of Exception, except clause, try clause	1	02/07/22			
32.	Finally clause and User Defined Exceptions	1	05/07/22			
No. of classes required to complete UNIT – III: 09				**No. of classes taken:**		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	**Strings:** Basics of Strings, Slicing, Escape Characters	1	06/07/22			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	1	07/07/22			
35.	Built-in string methods	1	09/07/22			
36.	Programs on Strings	1	12/07/22			
37.	**Regular Expressions:** Using Special Characters, Regular Expression Methods	1	13/07/22			
38.	Named Groups in Python RegEx, glob Module	1	14/07/22			
39.	Programs on Regular Expressions	1	16/07/22			
40.	**Files:** Basics of File, Creating files	1	19/07/22			
41.	Operation on files – Read, Write and Search	1	20/07/22			
No. of classes required to complete UNIT – IV: 09				**No. of classes taken:**		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	21//07/22			
43.	Introduction to Classes	1	23/07/22			
44.	Programming Examples	1	26/07/22			
45.	Self-Variable, Methods	1	27/07/22			

46.	Constructor Method	1	28/07/22			
47.	Inheritance	1	30/07/22			
48.	Programs on Inheritance	1	02/08/22			
49.	Overriding Methods	1	03/08/22			
50.	Data Hiding	1	04/08/22			
51.	Programs on Overriding and Data Hiding	1	06/08/22			
No. of classes required to complete UNIT – V: 10				**No. of classes taken:**		

Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	Introduction to NumPy	1	10/08/22			
53.	Introduction to Pandas	1	11/08/22			
54.	Basic Operations using NumPy and Pandas	1	13/08/22			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment – I (Units-I, II & UNIT-III (Half of the Syllabus))	A1 = 5
I – Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1 = 15
I – Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1 = 10
Assignment – II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2 = 5
II – Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2 = 15
II – Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2 = 10
Mid Marks = 80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. M. Srinivasa Rao**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **Mr. N. SRINIVASARAO**
Course Name & Code **: DATA STRUCTURES & 20CS03**
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech. /II/A-sec **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVE (CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations. **(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving. (**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time. **(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees. (**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques. (**Understand - L2**)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**											**3**		
CO2	**3**	**1**											**3**		
CO3	**3**	**2**											**2**		
CO4	**3**	**1**											**3**		
CO5	**3**	**1**											**1**		

1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Algorithm Analysis & Introduction to arrays and Abstract Data Type (ADT)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
1.	Introduction to Data Structures	1	02-05-2022		TLM1	CO1	T1/T2	
2.	Classification of Data Structures	1	05-05-2022		TLM1	CO1	T1/T2	
3.	Introduction to Algorithm	1	06-05-2022		TLM1	CO1	T1/T2	
4.	Algorithm Analysis	1	07-05-2022		TLM1	CO1	T1/T2	
5.	Asymptotic Notations	1	09-05-2022		TLM1	CO1	T1/T2	
6.	List using Arrays	1	12-05-2022		TLM1	CO1	T1/T2	
7.	Single Linked List	3	13-05-2022 14-05-2022 16-05-2022		TLM1	CO1	T1/T2	
8.	Double Linked List & Assignment-1	3	19-05-2022 20-05-2022 21-05-2022		TLM1 TLM7	CO1	T1/T2	
9.	Circular Linked List	2	23-05-2022 26-05-2022		TLM1	CO1	T1/T2	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**				

UNIT-II: Stacks & Queues

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
10.	Stacks ADT	1	27-05-2022		TLM2	CO2	T1/T2	
11.	Stacks Using Arrays	1	28-05-2022		TLM1	CO2	T1/T2	
12.	Stacks Using Linked List	1	30-05-2022		TLM1	CO2	T1/T2	
13.	Infix To Postfix Conversion	2	02-06-2022 03-06-2022		TLM1	CO2	T1/T2	
14.	Postfix Evalution	1	04-06-2022		TLM1	CO2	T1/T2	
15.	Checking Balanced Parenthesis, Queue	1	06-06-2022		TLM1	CO2	T1/T2	
16.	Queue Using Array & Linked List	1	09-06-2022		TLM1	CO2	T1/T2	
17.	Circular Queue	1	10-06-2022		TLM1	CO2	T1/T2	
18.	Deque & Assignment-2	1	11-06-2022		TLM1 TLM7	CO2	T1/T2	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**				

UNIT-III: Sorting Techniques

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
19.	Bubble sort	1	13-06-2022		TLM2	CO3	T1/T2	
20.	Insertion Sort	1	16-06-2022		TLM1	CO3	T1/T2	
21.	Selection Sort	1	17-06-2022		TLM1	CO3	T1/T2	
22.	Merge Sort	2	18-06-2022 27-06-2022		TLM1	CO3	T1/T2	
23.	Quick Sort	2	30-06-2022 01-07-2022		TLM1	CO3	T1/T2	
24.	Heap Sort & Assignment-3	2	02-07-2022 04-07-2022		TLM1 TLM7	CO3	T1/T2	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**				

UNIT-IV: Trees

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
25.	Introduction to Trees	1	07-07-2022		TLM1	CO4	T1/T2	
26.	Binary Trees, Tree Traversals	2	08-07-2022 09-07-2022		TLM1	CO4	T1/T2	
27.	Binary Trees Implementation	1	11-07-2022		TLM2	CO4	T1/T2	
28.	Binary Search Trees	2	14-07-2022 15-07-2022		TLM1	CO4	T1/T2	
29.	AVL Trees	1	16-07-2022		TLM1	CO4	T1/T2	
30.	Operations & Examples, Assignment-4	2	18-07-2022 21-07-2022		TLM1 TLM7	CO4	T1/T2	
No. of classes required to complete UNIT-IV:09				**No. of classes taken:**				

UNIT-V: Graphs & Hashing Techniques

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
31.	Graphs, Fundamentals	1	22-07-2022		TLM1	CO5	T1/T2	
32.	Representation of Graphs	1	23-07-2022		TLM1	CO5	T1/T2	
33.	BFS	2	25-07-2022 28-07-2022		TLM1	CO5	T1/T2	
34.	DFS	2	29-07-2022 30-07-2022		TLM1	CO5	T1/T2	
35.	Hashing Introduction	1	01-08-2022		TLM1	CO5	T1/T2	
36.	Hash function, separate Chaining	2	04-08-2022 05-08-2022		TLM1	CO5	T1/T2	
37.	Linear & Quadratic Probing	2	06-08-2022 08-08-2022		TLM1	CO5	T1/T2	
38.	Double & Rehashing	1	11-08-2022		TLM2	CO5	T1/T2	
39.	Revision & Assignment-5	1	12-08-2022		TLM1 TLM7	CO5	T1/T2	
40.	Revision	1	13-08-2022		TLM1	CO5	T1/T2	
No. of classes required to complete UNIT-V:14				**No. of classes taken:**				

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM7	Assignment/Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max (M1, M2) + 25% of Min (M1, M2)	M=15
Quiz Marks =75% of Max (Q1, Q2) +25% of Min (Q1, Q2)	B=10
Cumulative Internal Examination (CIE): A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. N. SrinivasaRao**	**Mr. A. S. R. C. Murthy**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : **Dr. D. Veeraiah**
Course Name & Code : CONSTITUTION OF INDIA (20MC01)

L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., CSE., II-Sem., A A.Y: 2021-22

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive, Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commission and the process and about SC, ST,OBC and women.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

T1 Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi

T2 Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

R1 Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.

R2 Subash Kashyap, Indian Constitution, National Book Trust.

R3 J.A. Siwach, Dynamics of Indian Government and Politics.

R4 D.C. Gupta, Indian Government and Politics.

R5 H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).

R6 J.C. Johari, Indian Government and Politics Hans.

R7 J.Raj, Indian Government and Politics.

R8 M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.

R9Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction to Indian Constitution

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
1.	Introduction and Co-Po and Syllabus	1	05-05-2022		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	07-05-2022		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	12-05-2022		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	14-05-2022		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	19-05-2022		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	21-05-2022		TLM2	CO1	T1 / T2	
7.	Assignment -I				TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		**6**			**No. of classes taken:**			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	26-05-2022		TLM2	CO2	T1 / T2	
9	Federalism Centre	1	28-05-2022		TLM2	CO2	T1 / T2	
10	State Relationships to the Union	1	02-06-2022		TLM2	CO2	T1 / T2	
11	President Role, Power, and Position	1	04-06-2022		TLM2	CO2	T1 / T2	
12	Prime Minister (PM) and Council of Ministers, cabinet and Central Secretariat Powers and duties	1	09-06-2022		TLM2	CO2	T1 / T2	
13	Lok Sabha, Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	11-06-2022		TLM2	CO2	T1 / T2	
14	Assignment II				TLM7	CO2	T1 / T2	
I MID EXAMINATIONS 20-06-2022 to 25-06-2022								
		6			**No. of classes taken:**			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	State Government and its Administration Governor and Role	1	16-06-2022		TLM2 / TLM4	CO3	T1 / T2	
16	Role of Chief Ministers and Council of Ministers	1	18-06-2022		TLM2 / TLM4	CO3	T1 / T2	
17	State Secretariat Functions	1	30-06-2022		TLM2 / TLM4	CO3	T1 / T2	
18	Organization ,Structure and Functions of State Governments	1	02-07-2022		TLM2 / TLM4	CO3	T1 / T2	
19	Assignment –III				TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		**04**			**No. of classes taken:**			

UNIT-IV: A Local Administration

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
20	A Local Administration	1	07-07-2022		TLM2 / TLM4	CO4	T1 / T2	
21	Role and importance of local administration	1	09-07-2022		TLM2 / TLM4	CO4	T1 / T2	
22	Municipalities –Mayor and Role of Elected Representative	1	14-07-2022		TLM2 / TLM4	CO4	T1 / T2	
23	Functions of Panchayati Raj Institution, Zilla Panchayats ,Elected Official and their roles	1	16-07-2022		TLM2 / TLM4	CO4	T1 / T2	
24	Village level-Role of Elected and Appointed officials. /Assignment-IV	1	21-07-2022		TLM2/ TLM 7	CO4	T1 / T2	
No. of classes required to complete UNIT-IV		**05**			**No. of classes taken:**			

UNIT-V: Election Commission

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25	Election Commission: Role of Chief Election Commissioner and Election Commissionerate	1	23-07-2022		TLM2 / TLM4	CO5	T1 / T2	
26	State Election Commission	2	28-07-2022 30-07-2022		TLM2 / TLM4	CO5	T1 / T2	
27	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	2	04-08-2022 06-08-2022		TLM2 / TLM4	CO5	T1 / T2	
No. of classes required to complete UNIT-V		**03**			**No. of classes taken:**			

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Consumer Rights Industrial policies	1	11.08.2022		TLM2/ TLM5		T2/R3	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM 7	Assignment /Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.D.Veeraiah		Dr.D.Veeraiah	Dr.D.Veeraiah

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.S.Vijaya Dasaradha
Course Name & Code : Engineering Chemistry Lab & 20FE53
L-T-P Structure : 0-0-3 **Credits : 1.5**
Program/Sem/Sec : B.Tech/II-Sem/CSE-A **A.Y. :** 2021-22

Pre-requisites: Nil

Course Educational Objectives: This course enables the students to analyze water samples and perform different types of volumetric titrations. It provides them with an overview of preparation of polymers and analytical techniques.

Course Outcomes: At the end of the course, the student shall be able to

CO1: Assess alkalinity of water based on the procedure given. (L2)
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (L2)
CO3: Acquire practical knowledge related to preparation of polymers. (L2)
CO4: Exhibit skills in performing experiments based on theoretical fundamentals. (L2)

COURSE ARTICULATION MATRIX (Correlation between COs, POs):

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Note: **1-** Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

REFERENCE: BOS Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Introduction to Engineering Chemistry lab	3	06-05-2022		TLM1	CO4	
2.	Introduction to volumetric analysis.	3	13-05-2022		TLM1	CO4	
3.	Preparation of Bakelite	3	20-05-2022		TLM4	CO3,CO4	
4.	Determination of amount of HCl using standard Na_2CO_3 solution.	3	27-05-2022		TLM4	CO2,CO4	
5.	Preparation of nylon fibres.	3	03-06-2022		TLM4	CO3,CO4	
6.	Determination of Mg^{+2} using standard EDTA solution.	3	10-06-2022		TLM4	CO2,CO4	
7.	Determination of pH of the given sample solution/soil using pH meter.	3	17-06-2022		TLM4	CO2,CO4	
8.	Estimation of Mohr's salt using potassium permanganate.	3	01-07-2022		TLM4	CO2,CO4	
9.	Determination of alkalinity of water sample.	3	08-07-2022		TLM4	CO1,CO4	
10.	Estimation of Mohr's salt using potassium dichromate.	3	15-07-2022		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	22-07-2022		TLM4	CO2,CO4	
12.	Estimation of amount of HCl conductometrically using NH_4OH solution	3	29-07-2022		TLM4	CO2,CO4	
13.	Revision	3	05-08-2022		TLM4	CO2,CO4	
14.	Lab Internal Exam(Batch-I)	3	12-08-2022		TLM4	CO2,CO4	
15.	Lab Internal Exam(Batch-II)	3	12-08-2022		TLM4	CO2,CO4	
Total							

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part - C

EVALUATION PROCESS:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		**Marks**
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		**15 Marks**

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : N. Srinivas Rao/A. Sudhakar/ A. S. R. C. Murthy
Course Name & Code : DATA STRUCTURES LAB & 20CS53
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/II/A-Sec. **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques

COURSE OUTCOMES (CO): At the end of the course, student will be able to

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)
CO2: Implement Various Sorting Techniques. (**Apply - L3**)
CO3: Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	1		1								3		
CO2		2	1		1								3		
CO3		2	1		1								3		
CO4								2	2	2					

Note: 1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign
1.	Introduction & List using Arrays	3	04-05-2022		TLM4	CO1	
2.	Linked List Programs	12	11-05-2022 18-05-2022 25-05-2022 01-06-2022		TLM4	CO1	
3.	Stack, Queue Using Arrays, Linked List	6	08-06-2022 15-06-2022		TLM4	CO1	
4.	Infix to Postfix, Evaluation of Postfix Expression	3	29-06-2022		TLM4	CO1	
5.	Circular Queue Double Ended Queue	3	06-07-2022		TLM4	CO1	
6.	Bubble sort Selection sort Insertion sort	3	13-07-2022		TLM4	CO2	
7.	Merge sort Quick sort	3	20-07-2022		TLM4	CO2	
8.	Heap sort Binary Tree	3	27-07-2022		TLM4	CO2 CO3	
9.	Binary Search Tree	3	03-08-2022		TLM4	CO3	
10.	BFS, DFS	3	10-08-2022		TLM4	CO3	
11.	Lab Internal Exam	3	24-08-2022		TLM7	-	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM7	Assignment/Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Day-to-day work	A1 = 05
Record	A2 = 05
Internal test	A3 = 05
CIE Total: (A1+A2+A3)	**M1 = 15**
Procedure/Algorithm	B1 = 5
Experimentation/Program execution	B2 = 10
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 5
Viva voce	B5 = 5
SEE Total: (B1+B2+B3+B4+B5)	**M2 = 35**
Total Marks = CIE + SEE = (M1+M2)	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. N. SrinivasaRao**	**Mr. A. S. R. C. Murthy**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr K Naga Prasanthi
Course Name & Code : SHELL SCRIPTING LAB&20CS55
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., CSE., II-Sem., Section-A A.Y : 2021-22

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	-	2	3	-	-
CO2	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO3	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

REFERENCE BOOKS:

R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656

R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. GilbergPublisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256

R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - C

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**Module – I:** Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	10-05-2022		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	17-05-2022		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	24-05-2022		
4.	**Module–II: Introduction to Shell-** Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments,Basic Operators	2	31-05-2022		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	07-06-2022		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	14-06-2022		
7.	**Module – III:** Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	21-06-2022		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	28-06-2022		
9.	Commands related to inode, I/O redirection and piping, process		05-07-2022		

	control commands, mails.	2			
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	12-07-2022		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	19-07-2022		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	26-07-2022		
13.	Lab Internal Exam	2	02-08-2022		

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
PSO 2	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
PSO 3	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Dr.K. Naga Prasanthi	Dr.K. Naga Prasanthi	Dr. Y. Vijay Bhaskar Reddy	Dr. D. Veeraiah
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. M. Srinivasa Rao

Course Name & Code : Python Programming Lab (20CS54)

L-T-P Structure : 0-0-3 Credits : 1.5

Program/Sem/Sec : B.Tech. – CSE / II Sem / A A.Y. : 2021 – 22

PRE-REQUISITE: Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Apply building blocks of Python in solving computational problems.	Apply – Level 3
CO2:	Implement in-built data structures available in Python to solve computational problems.	Apply – Level 3
CO3:	Implement modular programming, string manipulations and Object-oriented programming in python.	Apply – Level 3
CO4:	Improve individual / teamwork skills, communication & report writing skills with ethical values.	---

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 – Low								**2 –** Medium					**3 –** High		

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Python IDE Installation and Basics of Python	3			DM5
2.	Language basics and example problems	6			DM5
3.	Programs on Lists	3			DM5
4.	Programs on Tuples	3			DM5
5.	Programs on Sets	3			DM5
6.	Programs on Dictionaries	3			DM5
7.	Programs on Functions and Recursion	3			DM5
8.	Programs on Date and Time Modules, Exception Handling	3			DM5
9.	Programs on Strings	3			DM5
10.	Programs on Regular Expressions	3			DM5
11.	Programs on Object-Oriented Programming	3			DM5
12.	Programs on Python Libraries – Numpy , Pandas , Matplotlib	3			DM5
13.	Internal Lab Exam	3			DM4

Delivery Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. M. Srinivasa Rao**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

PART-C

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. M. Srinivasa Rao**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. K. SRIDEVI
Course Name & Code : PC-II, 20FE02
L-T-P Structure : **2-0-0** **Credits:** 02
Program/Sem/Sec : CSE-B –II SEM
A.Y. : 2021-22

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
CO5	Write well structured essays; Reports &Résumé.	L3

UNIT-I

Fabric of Change-'H.G. Wells and the Uncertainties of Progress–Peter J. Bowler'; Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary**:** Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting; Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';

Reading: Global Comprehension; Detailed Comprehension; Grammar & Vocabulary**:** Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays using suitable claims and evidences.

UNIT-III

'Homi Jahangir Bhabha'; Grammar & Vocabulary: Words often confused; Common Errors; Writing**:** Incident & Investigation Reports.

UNIT-IV

'Jagadish Chandra Bose'; Grammar & Vocabulary: Use of antonyms; Correction of Sentences; Writing**:** Dialogue Writing.

UNIT-V

'**Prafulla Chandra Ray'**; Grammar & Vocabulary: Analogy; Sentence Completion; Writing**:** Writing a Résumé

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1		1		1			3	3		2			
CO2		1		1		1			3	3		2			
CO3		1		1		1			3	3		2			
CO4		1		1		1			3	3		2			
CO5		1		1		1			3	3		2			
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1 Prabhavati. Y & etal , "English All Round –Communication Skills for Undergraduate Learners" ,Orient Black Swan, Hyderabad, 2019

T2 "The Great Indian Scientists" published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

R1 Swan, M., "Practical English Usage", Oxford University Press, 2016.

R2 Kumar, Sand Latha, P, "Communication Skills", Oxford University Press, 2018.

R3 Rizvi Ashraf M.,"Effective Technical Communication", Tata Mc Graw Hill, NewDelhi, 2008.

R4 Baradwaj Kumkum, "Professional Communication",I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.

R5 Wood, F. T., "Remedial English Grammar" , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	05-05-2022		TLM2	
2.	**Fabric of Change-**'H.G. Wells and the Uncertainties of Progress– Peter J. Bowler'	01	10-05-2022		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	12-05-2022		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	17-05-2022		TLM2	
5.	Adjectives and adverbs	01	19-05-2022		TLM2	
6.	Degrees of Comparison	01	24-05-2022		TLM2	
7.	Writing: Information Transfer.	01	26-05-2022		TLM2 TLM6	
No. of classes required to complete UNIT-I: 07				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	**Tools for Life -** 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';	01	31-05-2022		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	02-06-2022		TLM2	
10.	Active & Passive Voice	01	07-06-2022		TLM2	
11.	Idioms & Phrases	01	09-06-2022		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	01	14-06-2022		TLM2 TLM6	
No. of classes required to complete UNIT-II: 05				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	**'Homi Jahangir Bhabha'**	02	16-06-2022		TLM2 TLM6	
14.	Words often confused	01	28-06-2022		TLM2	
15.	Common Errors	01	30-06-2022		TLM2	
16.	Report Writing – Types & Formats	01	05-07-2022		TLM2	
17.	Incident and Investigation Reports	01	07-07-2022		TLM2 TLM6	
No. of classes required to complete UNIT-III: 06				**No. of classes taken:**		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

18.	**Jagadish Chandra Bose**	01	12-07-2022		TLM2 TLM2	
19.	Use of antonyms	01	14-07-2022		TLM2	
20.	Correction of Sentences	01	19-07-2022		TLM2	
21.	Formal and Informal dialogues	01	21-07-2022		TLM2	
22.	Dialogue Writing.	01	26-07-2022		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 05				**No. of classes taken:**		

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	**Prafulla Chandra Ray**	01	28-07-2022		TLM2	
24.	Analogy	01	02-08-2022		TLM2	
25.	Sentence Completion	01	04-08-2022		TLM2	
26.	Resume - Formats	01	09-08-2022		TLM2	
27.	Writing a Résumé	01	11-08-2022		TLM2 TLM6	
No. of classes required to complete UNIT-V: 05				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	K. Sridevi	Dr. B. Samrajya Lakshmi	Dr. B. Samrajya Lakshmi	Dr. A. Ramireddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. K. Jhansi Rani
Course Name & Code : Linear algebra & Transformation Techniques&20FE04
L-T-P Structure : 2-1 -0 **Credits:3**
Program/Sem/Sec : I B.Tech/II sem/B **A.Y.:** 2020 - 21

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra. also students introduced to integral transformation which includes Laplace transformation and Z – Transformations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Investigate the consistency of the system of equations and solve them.
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem.
CO3	Use the concepts of Laplace transforms to various forms of functions.
CO4	Solve Ordinary differential equations by using Laplace Transformations.
CO5	Apply Z- Transformations to solve difference equations.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	-	-	-	-	-	-	1			
CO2	3	2	-	2	-	-	-	-	-	-	-	1			
CO3	3	2	-	2	-	-	-	-	-	-	-	1			
CO4	2	1	-	1	-	-	-	-	-	-	-	1			
CO5	3	2	-	2	-	-	-	-	-	-	-	1			
1 - Low						**2 –**Medium						**3 -** High			

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, " Elementary Differential Equations" , 7th Edition, John Wiley & sons, New Delhi,2011.

R4 S. S. Sastry, " Introductory Methods of Numerical Analysis" 5th Edition, PHI Learning Private

Limited, New Delhi, 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	02/05/22		TLM1	
2.	Introduction to UNIT I	1	04/05/22		TLM2	
3.	Echelon form of a matrix	1	05/05/22		TLM1	
4.	Echelon form of a matrix	1	07/05/22		TLM1	
5.	Normal form of a matrix	1	09/05/22		TLM1	
6.	Normal form of a matrix	1	11/05/22		TLM1	
7.	PAQ form	1	12/05/22		TLM1	
8.	Solution of Homogeneous linear system of equations	1	16/05/22		TLM1	
9.	**Tutorial 1**	1	18/05/22		TLM3	
10.	Solution of Non homogeneous Linear system of equations	1	19/05/22		TLM1	
11.	Solution of Non homogeneous Linear system of equations	1	21/05/22		TLM1	
12.	Solution of Non homogeneous Linear system of equations	1	23/05/22		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	25/05/22		TLM2	
14.	Eigen values of a matrix	1	26/05/22		TLM1	
15.	Eigen values and Eigen vectors of a matrix	1	28/05/22		TLM1	
16.	Eigen values and Eigen vectors of a matrix	1	30/05/22		TLM1	
17.	Properties	1	01/06/22		TLM1	
18.	Properties		04/06/22			
19.	Cayley – Hamilton Theorem	1	06/06/22		TLM1	
20.	**TUTORIAL 2**	1	08/06/22		TLM3	
21.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	09/06/22		TLM1	
22.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	11/06/22		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Laplace Transformation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	13/06/22		TLM2	
24.	Standard forms of Laplace Transformations	1	15/06/22		TLM1	
25.	Linear Property, Shifting Theorem	1	16/06/22		TLM1	

26.	Change of scale property, Multiplication by t	1	18/06/22		TLM1	
27.	Multiplication by t	1	27/06/22		TLM1	
28.	Division by t	1	28/06/22		TLM3	
29.	**TUTORIAL 3**	1	29/06/22		TLM 1	
30.	Transformation derivatives and Integrals	1	30/06/22		TLM1	
31.	Transformation integrals	1	02/07/22		TLM1	
32.	Unit step function and Dirac's delta function	1	04/07/22		TLM1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Inverse Laplace Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction to UNIT IV	1	06/07/22		TLM1	
34.	Linear property	1	07/07/22		TLM1	
35.	Shifting properties	1	11/07/22		TLM1	
36.	Inverse Laplace transformation by using partial fractions	1	13/07/22		TLM1	
37.	Inverse Laplace transformation by using partial fractions	1	14/07/22		TLM1	
38.	Inverse Laplace Transformation by using Convolution theorem	1	16/07/22		TLM1	
39.	Inverse Laplace Transformation by using Convolution theorem	1	18/07/22		TLM3	
40.	**TUTORIAL 4**	1	20/07/22		TLM1	
41.	Solving of Ordinary differential equation by Laplace transform method	1	21/07/22		TLM1	
42.	Solving of Ordinary differential equation by Laplace transform method	1	23/07/22		TLM3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Z- Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction to UNIT V	1	25/07/22		TLM1	
44.	Standard forms of Z-Transformation	1	27/07/22		TLM1	
45.	Damping rule	1	28/07/22		TLM1	
46.	Shifting Rule	1	30/07/22		TLM1	
47.	Initial and final value theorems	1	01/08/22		TLM1	
48.	Inverse Z – Transformations	1	03/08/22		TLM1	
49.	Inverse Z – Transfroms by using partial fractions	1	04/08/22		TLM1	
50.	Inverse Z – Transformation by using convolution theorem	1	06/08/22		TLM1	
51.	Solving of Difference equations by using Z – Transformations	1	08/08/22		TLM1	
52.	Solving of Difference equations by using Z - Transformations	1	10/08/22		TLM1	
53.	**TUTORIAL 5**	1	11/08/22		TLM3	
54.	Content beyond the syllabus	1	13/08/22		TLM5	

No. of classes required to complete UNIT-V:12	No. of classes taken:

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. K. Jhansi Rani**	**Dr. K. Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry&20FE06
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/IIsem-CSE-B **A.Y. :** 2021-22

PREREQUISITE: Electrode potential, Cell potential of a cell/EMF of a cell, primary & secondary batteries, isotropy and anisotropy in crystals, qualitative and quantitative analysis.

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications.
CO2	Apply principles of corrosion for design and effective maintenance of various equipment.
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicir
CO4	Identify the importance of liquid crystals, polymers in advanced technologies.
CO5	Apply the principles of analytical techniques in chemical analysis.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1		2	2					2
CO2	3	2	2	1		2	1					2
CO3	3	2	2	1		1	1					2
CO4	3	2	2	1		1	1					2
CO5	3	2	1	1		1	1					2

TEXTBOOKS:

T1 Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.

T2 Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16th Edition, 2015.

REFERENCE BOOKS:

R1 Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015.

R2 S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010.

R3 Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1st Edition, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ELECTRO CHEMISTRY & BATTERIES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Cos	1	05-05-2022		TLM1	
2.	Introduction to Unit-I	1	06-05-2022		TLM1	
3.	Applications of Electro chemical Series,	1	07-05-2022		TLM1	
4.	Calculation of EMF of Cell,	1	10-05-2022		TLM1	
5.	Practice exercises on applications of Electro chemical series,	1	12-05-2022		TLM1	
6.	Glass Electrode	1	13-05-2022		TLM1	
7.	Calomel Electrode, Nernst equation derivation	1	14-05-2022		TLM1	
8.	Applications of Nernst Equation	1	17-05-2022		TLM1	
9.	Lead-acid Battery	1	19-05-2022		TLM1	
10.	Lithium-ion Battery	1	20-05-2022		TLM1	
11.	$H_2 - O_2$ Fuel cell, Mg-Cu reserve battery.	1	21-05-2022		TLM1	
12.	Revision of unit 1	1	24-05-2022		TLM1	
13.	**Assignment**		26-05-2022		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, Examples,dry corrosion	1	27-05-2022		TLM1	
2.	corrosion by other gases and liquid metal corrosion dry corrosion, pilling bed worth rule.	1	28-0-2022		TLM1	
3.	Coditions to occur wet corrosion.Mechanism-oxygen absorption, hydrogen evolution, types of wet corrosion	1	31-05-2022		TLM1	
4.	Galvanic Corrosion, passivity and Galvanic series.	1	02-06-2022		TLM1	
5.	Concentration Cell Corrosic	1	03-06-2022		TLM1	
6.	Factors influencing corrosionNature of metal, Nature of environment	1	04-06-2022		TLM1	
7.	Cathodic Protection	1	07-06-2022		TLM1	
8.	Electroplating, metal cladding.	1	09-06-2022		TLM1	
9.	Revision	1	10-06-2022			
10.	**Assignment**	1	11-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials,	1	14-06-2022		TLM1	
2.	Gas-Phase Synthesis of nanomaterials, Applications.	1	16-06-2022			
3.	Materials in Electronic devices	1	17-06-2022		TLM1	
4.	Contd.. Materials in Electronic devices	1	18-06-2022		TLM1	
5.	Discussion on MID-I marks evaluation		28-06-2022			
6.	Characteristics of Molecular motors and machines	1	30-06-2022		TLM1	
7.	Rotaxanes and Catenanes as artificial molecular machines	1	01-07-2022		TLM1	
8.	Contd..rotaxanes and Catenanes as artificial	1	02-07-2022		TLM1	

	molecular machines					
9.	Automated light powered molecular motor	1	05-07-2022		TLM1	
10.	**Assignment**	1	07-07-2022		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: LIQUID CRYSTALS & POLYMERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Classification of liquid crystals	1	08-07-2022		TLM1	
2.	Applications of liquid crystals.	1	12-07-2022		TLM1	
3.	Introduction and types of polymrerisations,	1	14-07-2022		TLM1	
4.	Plastics	1	15-07-2022		TLM1	
5.	Rubbers	1	16-07-2022		TLM1	
6.	Conducting polymers.	1	19-07-2022		TLM1	
7.	Bio-degradable polymers	1	21-07-2022		TLM1	
8.	Revision	1	22-07-2022			
9.	**Assignment**	1	23-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 9				No. of classes taken:		

UNIT-V: ANALYTICAL TECHNIQUES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of analysis	1	26-072022		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	1	28-07-2022		TLM1	
3.	Strong acid vs weak base titrations.	1	29-07-2022		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	30-07-2022		TLM1	
5.	Principle of potentiometry Acid-base titration.	1	02-08-2022		TLM1	
6.	Determination of iron by using thiocynate reagent.	1	04-08-2022		TLM1	
7.	Colorimetry, Principle determination of iron by thiocynate as a reagent.	1	05-08-2022		TLM1	
8.	Revision	1	06-08-2022			
9.	Assignment	1	09-08-2022			
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

Topics beyond the syllabus:

Sl.No	Topics to be coverd	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign
1.	Batteries used in mobile phones of popular companies.	1	11-08-2022		TLM1	
2.	Industrial applications of electroplating	1	12-08-2022		TLM1	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.K.Jamili Reddy	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Usha Rani Bajjuri	
Course Name & Code	: Python Programming (20CS05)	
L-T-P Structure	: 3-0-0	Credits : 3
Program/Sem/Sec	: B.Tech., CSE., II-Sem., B	A.Y : 2021-22

PRE-REQUISITE: C Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to provide basic knowledge of python. python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language for Problem solving and programming capability.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Identify basic building blocks of python to solve mathematical problems. (UnderstandL2)
CO 2	Apply the in-built data structures like list, tuple, set and dictionary for solving problems. (Apply - L3)
CO 3	Use exception-handling mechanism to catch run-time errors (Apply - L3)
CO 4	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling. (Understand - L2)
CO 5	Demonstrate object-oriented programming principles of python. (Understand - L2)

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	-	1	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO4	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO5	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**

1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

T1 Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford Publications

T2 Python for Everybody: Exploring Data In Python 3by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

R1 Jacob Fredslund, "Introduction to Python Programming", 2007.

R2 Y.Daniel Liang, "Introduction to programming using python", Pearson, 2013.

R3 R. Nageswara Rao, "Core python programming", Dreamtech, 2017.

R4 Mark Summerfield, "Programming in Python 3" Pearson Education, 2nd Edition, 2010.

R5 Magnus Lie Hetland, "Beginning Python – From Novice to Professional", APress Publication, 3rd Edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction to Python , Operators & Control Structures

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
28.	Introduction to Programming, History of Python	1	02-05-2022		TLM2/ TLM4	CO1	T1 / T2	
29.	Usage of Python Interpreter, Python Shell.	1	04-05-2022		TLM2/ TLM4	CO1	T1 / T2	
30.	Indentation, Python Built-in types , Variables	1	06-05-2022		TLM2/ TLM4	CO1	T1 / T2	
31.	Input-Output Statements	1	09-05-2022		TLM2/ TLM4	CO1	T1 / T2	
32.	Identifiers, keywords, Literals, Simple programs	1	10-05-2022		TLM2/ TLM4	CO1	T1 / T2	
33.	Arithmetic , Relational, Logical Operators, Assignment Operators	1	11-05-2022		TLM2/ TLM4	CO1	T1 / T2	
34.	Bitwise Operators, Python Membership Operator, Python Identity Operator	1	13-05-2022		TLM2/ TLM4	CO1	T1 / T2	
35.	Operator Precedence , Programming Examples	1	16-05-2022		TLM2/ TLM4	CO1	T1 / T2	
36.	Conditonal Statements – if, if-else, Nested If-else	1	17-05-2022		TLM2/ TLM4	CO1	T1 / T2	
37.	Jumping Statements – continue, break, pass , Python Loops – While loop	1	18-05-2022		TLM2/ TLM4	CO1	T1 / T2	
38.	Python Loops – for loop , Nested Loops with Programs	1	20-05-2022		TLM2/ TLM4	CO1	T1 / T2	

39.	Mathematical functions & constants, Random Number functions	1	23-05-2022		TLM2/ TLM4	CO1	T1 / T2	
40.	Tutorial - 1	1	24-05-2022		**TLM3/ TLM6**			
No. of classes required to complete UNIT-I		**13**			**No. of classes taken:**			

UNIT-II: Python Lists , Tuples , Sets , Dictionaries

S.No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign
		Required	Completion	Completion	Methods	COs	followed	Weekly
14.	Python List - concept , Creating and Accessing Elements	1	25-05-2022		TLM2 / TLM4	CO2	T1 / T2	
15.	Updating Lists & Deleting Lists , Basic List operations	1	27-05-2022		TLM2 / TLM4	CO2	T1 / T2	
16.	Reverse, Indexing , Slicing , Matrices	1	30-05-2022		TLM2 / TLM4	CO2	T1 / T2	
17.	Built-in List Functions	1	31-05-2022		TLM2 / TLM4	CO2	T1 / T2	
18.	Python Tuples – Introduction , Creating and Deleting	1	01-06-2022		TLM2 / TLM4	CO2	T1 / T2	
19.	Accessing Values in a Tuple , Updating tuples , Delete tuple elements	1	03-06-2022		TLM2 / TLM4	CO2	T1 / T2	
20.	Basic tuple operations , Indexing , Slicing and Matrices, Built-in tuple functions	1	06-06-2022		TLM2 / TLM4	CO2	T1 / T2	
21.	Sets-concepts, operations	1	07-06-2022		TLM2 / TLM4	CO2	T1 / T2	
22.	Dictionaries – Introduction , Accessing , Working	1	08-06-2022		TLM2 / TLM4	CO2	T1 / T2	
23.	Dictionary Properties & Functions	1	10-06-2022		TLM2 / TLM4	CO2	C	
24.	Tutorial – II / Quiz - II	1	13-06-2022		TLM3/ TLM6			
No. of classes required to complete UNIT-II		**11**			**No. of classes taken:**			

UNIT-III: Python Functions, Modular Design & Exception Handling

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25.	Defining and calling a function - Examples	1	14-06-2022		TLM2 / TLM4	CO3	T1 / T2	
26.	Types of functions, Function arguments , Anonymous functions	1	15-06-2022		TLM2 / TLM4	CO3	T1 / T2	
27.	Global and Local variables, Recursion with programs	1	17-06-2022		TLM2 / TLM4	CO3	T1 / T2	
28.	Introduction to Modules – Creating , Import statement , from	1	27-06-2022		TLM2 / TLM4	CO3	T1 / T2	
29.	Date and Time Module	1	28-06-2022		TLM2 / TLM4	CO3	T1 / T2	
30.	Programs on Modules	1	29-06-2022		TLM2 / TLM4	CO3	T1 / T2	
31.	Exception Handling – Exceptions, Except clause , try Finally clause		01-07-2022		TLM2 / TLM4	CO3	T1 / T2	
32.	User Defined Exceptions	1	04-07-2022		TLM2 / TLM4	CO3	T1 / T2	
33.	Tutorial – III / Quiz - III	1	05-07-2022		**TLM3/ TLM6**			
No. of classes required to complete UNIT-III		**09**			**No. of classes taken:**			

UNIT-IV: Python Strings , Regular Expression Operations & Files

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Python Strings - concept , Slicing, Escape Characters , String Special Operations	1	06-07-2022		TLM2 / TLM4	CO4	T1 / T2	
35.	String formatting operator , Triple quotes , raw string, Unicode strings	1	08-07-2022		TLM2 / TLM4	CO4	T1 / T2	
36.	Built-in string methods	1	11-07-2022		TLM2 / TLM4	CO4	T1 / T2	
37.	Programs on Strings	1	12-07-2022		TLM2 / TLM4		T1 / T2	
38.	Regular Expressions – Using Special Characters, Regular Expression Methods	1	13-07-2022		TLM2 / TLM4	CO4	T1 / T2	
39.	Named Groups in Python RegEx, Glob Module	1	15-07-2022		TLM2 / TLM4	CO4	T1 / T2	
40.	Programs on Regular Expressions	1	18-07-2022		TLM2 / TLM4	CO4	T1 / T2	
41.	Files – Creating files, Operation on files	1	19-07-2022		TLM2 / TLM4	CO4	T1 / T2	
42.	Tutorial – IV / Quiz - IV	1	20-07-2022		**TLM3/ TLM6**			
No. of classes required to complete UNIT-IV		**09**			**No. of classes taken:**			

UNIT-V: Object Oriented Programming OOP in Python

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	OOPs Concepts – Introduction , Classes	1	22-07-2022		TLM2 / TLM4	CO5	T1 / T2	
44.	ProgrammingExamples	1	25-07-2022		TLM2 / TLM4	CO5	T1 / T2	
45.	Self-Variable, Methods , Constructor Method	1	26-07-2022		TLM2 / TLM4	CO5	T1 / T2	
46.	Inheritance	1	27-07-2022		TLM2 / TLM4	CO5	T1 / T2	
47.	Example Programs	1	29-07-2022		TLM2 / TLM4	CO5	T1 / T2	
48.	Overriding Methods , Data Hiding	1	01-08-2022		TLM2 / TLM4	CO5	T1 / T2	
49.	Tutorial – V / Quiz - V	1	02-08-2022		**TLM3/ TLM6**			
No. of classes required to complete UNIT-V		**09**			**No. of classes taken:**			

Content Beyond the Syllabus

S.No.	Topics to be covered		No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed
1.	Introduction to Libraries		1	05-08-2022		TLM2/ TLM5		T2/R3
2.	Overview of NumPyLibrary		1	08-08-2022		TLM2/ TLM5		T2/R3

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:** The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:** To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:** The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Usha Rani Bajjuri	**Dr.M.Srinivasa Rao**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr.D.Veeraiah**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **A. S. R. C. Murthy**
Course Name & Code **: DATA STRUCTURES & 20CS03**
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech. /II/B-sec **A.Y.:** 2021-22

PREREQUISITE: Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.**(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving.(**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.**(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques.(**Understand - L2**)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**											**3**		
CO2	**3**	**1**											**3**		
CO3	**3**	**2**											**2**		
CO4	**3**	**1**											**3**		
CO5	**3**	**1**											**1**		
1 - Low					**2** –Medium							**3** - High			

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	02-05-2022		TLM1	
2.	Classification of Data Structures	1	04-05-2022		TLM1	
3.	Introduction to Algorithm	1	06-05-2022		TLM1	
4.	Algorithm Analysis	2	09-05-2022		TLM1	
5.	Asymptotic Notations	1	10-05-2022		TLM1	
6.	List using Arrays	1	11-05-2022		TLM1	
7.	Single Linked List	3	13-05-2022 16-05-2022 17-05-2022		TLM1	
8.	Double Linked List	3	18-05-2022 20-05-2022 23-05-2022		TLM1	
9.	Circular Linked List	2	24-05-2022 25-05-2022		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	27-05-2022		TLM2	
11.	STACKS USING ARRAYS	1	30-05-2022		TLM1	
12.	STACKS USING LINKED LIST	1	31-05-2022		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	01-06-2022 & 03-06-2022		TLM1	
14.	POSTFIX EVALUTION	1	06-06-2022		TLM1	
15.	CHECKING BALANCED PARANTHESIS, QUEUE	1	07-06-2022		TLM1	
16.	QUEUE USING ARRAY & LINKED LIST	1	08-06-2022		TLM1	
17.	CIRCULAR QUEUE,	1	10-06-2022		TLM1	
18.	DEQUE	1	13-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: SORTING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Bubble sort	1	14-06-2022		TLM2	

20.	Insertion Sort	1	17-06-2022		TLM1	
21.	Selection Sort	1	18-06-2022		TLM1	
22.	Merge Sort	2	27-06-2022 & 28-06-2022		TLM1	
23.	Quick Sort	2	29-06-2022 & 01-07-2022		TLM1	
24.	Heap Sort	2	04-07-2022 & 05-07-2022		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Introduction to Trees	1	06-07-2022		TLM1	
26.	Binary Trees, Tree Traversals	2	08-07-2022 & 11-07-2022		TLM1	
27.	Binary Trees Implementation	1	12-07-2022		TLM2	
28.	Binary Search Trees	2	13-07-2022 & 15-07-2022		TLM1	
29.	AVL Trees	1	18-07-2022		TLM1	
30.	Operations & Examples	2	19-07-2022 & 20-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 09				**No. of classes taken:**		

UNIT-V: GRAPHS & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	GRAPHS, FUNDAMENTALS	1	22-07-2022		TLM1	
32.	REPRESENTATION OF GRAPHS	1	25-07-2022		TLM1	
33.	BFS	2	26-07-2022, 27-07-2022		TLM1	
34.	DFS	2	29-07-2022, 01-08-2022		TLM1	
35.	Hashing Introduction,	1	29-07-2022		TLM1	
36.	Hash function, separate Chaining	2	01-08-2022, 02-08-2022		TLM1	
37.	Linear & Quadratic Probing	2	02-08-2022, 03-08-2022		TLM1	
38.	Double & Rehasing	1	05-08-2022		TLM2	
39.	Revision	1	08-08-2022		TLM1	
40.	Revision	1	10-08-2022		TLM1	

41.	Revision	1	12-08-2022		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. S. R. C. Murthy**	**Mr. A. S. R. C. Murthy**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : **K.RAVI KIRAN YASASWI**
Course Name & Code : CONSTITUTION OF INDIA (20MC01)

L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., CSE., II-Sem., C A.Y: 2021-22

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive ,Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commision of India
- To Understand the Central and State relation, financial and administrative.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commision and the process and about SC,ST,OBC and women.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

T1 Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi

T2 Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

R1 Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.

R2 Subash Kashyap, Indian Constitution, National Book Trust.

R3 J.A. Siwach, Dynamics of Indian Government and Politics.

R4 D.C. Gupta, Indian Government and Politics.

R5 H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).

R6 J.C. Johari, Indian Government and Politics Hans.

R7 J.Raj, Indian Government and Politics.

R8 M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.

R9Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction to Indian Constitution

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
1.	Introduction and Co-Po and Syllabus	1	04-05-2022		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	10-05-2022		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	11-05-2022		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	17-05-2022		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	18-05-2022		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	24-05-2022		TLM2	CO1	T1 / T2	
7.	Assignment -I	1	25-05-2022		TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		**7**			**No. of classes taken:**			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	31-05-2022		TLM2	CO2	T1 / T2	
9	Federalism Centre	1	03-06-2022		TLM2	CO2	T1 / T2	
10	State Relationships to the Union	1	04-06-2022		TLM2	CO2	T1 / T2	
11	President Role, Power and Position	1	10-06-2022		TLM2	CO2	T1 / T2	
12	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties	1	11-06-2022		TLM2	CO2	T1 / T2	
13	Lok Sabha,Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	17-06-2022		TLM2	CO2	T1 / T2	
14	Assignment II	1	18-06-2022		TLM7	CO2	T1 / T2	
I MID EXAMINATIONS 20-06-2022 to 25-06-2022								
		7			**No. of classes taken:**			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	State Government and its Administration Governor and Role	1	28-06-2022		TLM2 / TLM4	CO3	T1 / T2	
16	Role of Chief Ministers and Council of Ministers	1	29-06-2022		TLM2 / TLM4	CO3	T1 / T2	
17	State Secretariat Functions	1	05-07-2022		TLM2 / TLM4	CO3	T1 / T2	
18	Organisation ,Structure and Functions of State Governments	1	06-07-2022		TLM2 / TLM4	CO3	T1 / T2	
19	Assignment –III	1	12-07-2022		TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		**05**			**No. of classes taken:**			

UNIT-IV: A Local Administration

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
20	A Local Administration	1	13-07-2022		TLM2 / TLM4	CO4	T1 / T2	
21	Role and importance of local administration	1	19-07-2022		TLM2 / TLM4	CO4	T1 / T2	
22	Municipalities –Mayor and Role of Elected Representative	1	20-07-2022		TLM2 / TLM4	CO4	T1 / T2	
23	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles	1	26-07-2022		TLM2 / TLM4	CO4	T1 / T2	
24	Village level-Role of Elected and Appointed officials./Assignment-IV	1	27-07-2022		TLM2/ TLM 7	CO4	T1 / T2	
No. of classes required to complete UNIT-IV		**05**			**No. of classes taken:**			

UNIT-V: Election Commission

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25	Election Commission :Role of Chief Election Commissioner and Election Commisionerate	1	02-08-2022		TLM2 / TLM4	CO5	T1 / T2	
26	State Election Commission	1	03-08-2022		TLM2 / TLM4	CO5	T1 / T2	
27	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	10-08-2022		TLM2 / TLM4	CO5	T1 / T2	
No. of classes required to complete UNIT-V		**03**			**No. of classes taken:**			

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Consumer Rights Industrial policies	1	13.08.2022		TLM2/ TLM5		T2/R3	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM 7	Assignment /Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:**The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:**To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:**The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
K.Ravi Kiran Yasaswi	K.Ravi Kiran Yasaswi	Dr.D.Veeraiah	Dr.D.Veeraiah

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry Lab&20FE53
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/IIsem/CSE-B **A.Y. :** 2020-22

Pre requisites: Nil

Course Educational Objective: This course enables the students to analyze water sample for alkalinity. perform and distinguish different types of volumetric titrations. get hands-on experience with preparation of polymers. use analytical techniques like conductometry, potentiometry and colorimetry.

Course Outcomes: After completion of the course, the students will be able to,
CO1: Assess alkalinity of water based on the procedure given.
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.
CO3: Acquire practical knowledge related to preparation of polymers.
CO4: Exhibit skills in performing experiments based on theoretical fundamentals.

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

Bos Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Engineering chemistry lab	3	02-05-2022		TLM1	CO4	
2.	Determination of amount of HCl using standard Na_2CO_3 solution	3	09-05-2022		TLM4	CO2,CO4	
3.	Determination of alkalinity of water sample.	3	16-05-2022		TLM4	CO1,CO4	
4.	Estimation of Mg+2/Zn+2/Ca+2 in given solution by using standard EDTA solution.	3	23-05-2022		TLM4	CO2, CO4	
5.	Preparation of nylon fibres.	3	30-05-2022		TLM4	CO3	
6.	Preparation of Bakelite	3	06-06-2022		TLM4	CO3	
7.	Estimation of Mohr's salt by using potassium permanganate.	3	13-06-2022		TLM4	CO2	
8.	Estimation of ferrous ion by using potassium dichromate.	3	27-06-2022		TLM4	CO2	
9.	Determination of pH of the given sample solution using pH meter	3	04-07-2022		TLM4	CO4	
10.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	11-07-2022		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using NH4OH solution.	3	18-07-2022		TLM4	CO2,CO4	
12.	Estimation of amount of HCl potentiometrically using NaOH solution.	3	25-08-2022		TLM4	CO2, CO4	

13.	Internal lab exam	3	01-08-2022				
Total							

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part - C

EVALUATION PROCESS:

According to Academic Regulations of R20 Distribution and Weightage of Marks For Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		**15 Marks**

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.K.Jamili Reddy**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Usha Rani Bajjuri	
Course Name & Code	: Python Programming Lab (20CS54)	
L-T-P Structure	: 0-0-3	Credits : 1.5
Program/Sem/Sec	: B.Tech., CSE., II-Sem., B	A.Y : 2021-22

PRE-REQUISITE : C Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Apply building blocks of Python in solving computational problems. (Apply - L3)
CO 2	Implement in-built data structures available in Python to solve computational problems. (Apply - L3)
CO 3	Implement modular programming, string manipulations and Object-oriented programming in python. (Apply - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**

1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

Introduction: Language basics and example problems (Two weeks)

a) Implement Python Script for checking the given year is leap year or not.

b) Implement Python Script for finding biggest number among 3 numbers.

c) Implement Python Script for displaying reversal of a number.

d) Implement Python Script to check given number is Armstrong or not.

e) Implement Python Script to print sum of N natural numbers.

f) Implement Python Script to check given number is palindrome or not.

g) Implement Python script to print factorial of a number.

h) Implement Python Script to print all prime numbers within the given range.

i) Implement Python Script to calculate the series: S=1+x+x2+x3+ ..... xn

j) Implement Python Script to print the following pattern:

```
*
*   *
*   *   *
```

Modue 1: Exercise Programs on Lists.

a) Write a Python script to display elements of list in reverse order.

b) Write a Python script to find the minimum and maximum elements without using built-in operations in the lists.

c) Write a Python script to remove duplicates from a list.

d) Write a Python script to append a list to the second list.

e) Write a Python script to count the number of strings in a list where the string length is 2 or more.

Module 2: Exercise Programs on Tuples.

a) Write a Python script to create a tuple with different data types.

b) Write a Python script to find the repeated items of a tuple.

c) Write a Python script to replace last value of tuples in a list.

Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]

Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]

d) Write a Python script to sort a tuple by its float element.

Sample data: [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]

Expected Output: [('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]

Module 3: Exercise Programs on Sets.

a) Write a Python script to add member(s) in a set.

b) Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.

c) Write Python script to test whether every element in S is in T and every element in T is in S.

Module 4: Exercise Programs on Dictionaries

a) Write a Python script to sort (ascending and descending) a dictionary by value.
b) Write a Python script to check whether a given key already exists or not in a dictionary.
c) Write a Python script to concatenate following dictionaries to create a new one.
   Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}
   Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
d) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
e) Write a Python program to map two lists into a dictionary.

Module 5: Exercise Programs on functions and recursion.

a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between given range X and Y.
c) Define functions to find mean, median, mode for the given numbers in a list.
d) Define a function which generates Fibonacci series up to n numbers.
e) Implement a python script for factorial of number by using recursion.
f) Implement a python script to find GCD of given two numbers using recursion.

Module 6: Exercise programs on Date and Time Modules.

a) Write a Python script to get the current time in Python.
b) Write a Python script to get current time in milliseconds in Python
c) Write a Python script to print next 5 days starting from today.

Module 7. Exercise programs on Exception Handling.

a) Write a Python script to handle simple errors by using exception handling mechanism.
b) Write a Python script to handle multiple errors with one except statement.

Module 8: Exercise programs on Strings

a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.
c) Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
d) Implement python script that takes a list of words and returns the length of the longest one.

Module 9: Exercise programs on Regular Expressions

a) Write a Python script to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9).
b) Write a Python script to check whether password is valid or not.

Conditions for a valid password are:

Should have at least one number.

Should have at least one uppercase and one lowercase character.

Should have at least one special symbol.

Should be between 6 to 20 characters long.

Module 10: Exercise programs on Object Oriented Programming

a) Write a Python script to create and access class variables and methods.

b) Write a Python script to implement method overloading.

c) Write a Python script to implement single inheritance.

d) Write a Python script to implement method overriding.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
41.	Installation and Working on Interpreter	3	06-05-2022		TLM4	CO1,CO4	
42.	Language Basics and Example Programs	3	13-05-2022		TLM4	CO1,CO4	
43.	Language Basics and Example Programs	3	20-05-2022		TLM4	CO1,CO4	
44.	Module-1 Programs on Lists	3	27-05-2022		TLM4	CO2,CO4	
45.	Module-2 Programs on Tuples	3	O3-06-2022		TLM4	CO2,CO4	
46.	Module-3 & 4 Programs on Sets Programs on Dictionaries	3	10-06-2022		TLM4	CO2,CO4	
47.	Module-5 Programs on Functions & Recursions	3	17-06-2022		TLM4	CO3,CO4	
48.	Module-6 Programs on Modules	3	01-07-2022		TLM4	CO3,CO4	
49.	Module-7 Programs on Exception Handling	3	08-07-2022		TLM4	CO3,CO4	
50.	Module-8 Programs on Strings	3	15-07-2022		TLM4	CO3,CO4	
51.	Module-9 Programs on Regular Expressions	3	22-07-2022		TLM4	CO3,CO4	
52.	Module-10 Programs on OOP	3	29-07-2022		TLM4	CO3,CO4	
53.	Internal Lab Exam	3	05-08-2022				

Teaching Learning Methods:

TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:** The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:** To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:** The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mrs. B. Usha Rani	**Dr.M.Srinivasa Rao**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr.D.Veeraiah**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **A. S. R. C. Murthy/N. Srinivas Rao/S. Srinivas Reddy**

Course Name & Code **: DATA STRUCTURES LAB & 20CS53**

L-T-P Structure **: 0-0-3** **Credits:** 1.5

Program/Sem/Sec : B.Tech/II/B-Sec. **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)

CO2: Implement Various Sorting Techniques. (**Apply - L3**)

CO3: : Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction & List using Arrays	3	05-05-2022		
2.	Linked List Programs	12	12-05-2022, 19-05-2022 26-05-2022 02-06-2022		
3.	Stack, Queue Using Arrays, Linked List	6	09-06-2022 16-06-2022		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	23-06-2022		
5.	Circular Queue Double Ended Queue	3	30-06-2022		
6.	Bubble sort Selection sort Insertion sort	3	07-07-2022		
7.	Merge sort Quick sort	3	14-07-2022		
8.	Heap sort Binary Tree	3	21-07-2022		
9.	Binary Search Tree	3	28-07-2022		
10.	BFS,DFS	3	04-08-20222		
11.	Lab Internal Exam	3	11-08-2022		

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. S. R. C. Murthy**	**Mr. A. S. R. C. Murthy**	**Dr. Y.V. B. Reddy**	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : TUMU VINEETHA
Course Name & Code : SHELL SCRIPTING LAB & 20CS55
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., CSE., II-Sem., Section- B A.Y : 2021-22

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	-	2	3	-	-
CO2	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO3	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

REFERENCE BOOKS:

R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656

R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. GilbergPublisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256

R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - C

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**Module – I:** Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	07-05-2022		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	14-05-2022		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	21-05-2022		
4.	**Module–II: Introduction to Shell-** Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments, Basic Operators	2	28-05-2022		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	04-06-2022		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	11-06-2022		
7.	**Module – III:** Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	18-06-2022		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	02-07-2022		

9.	Commands related to inode, I/O redirection and piping, process control commands, mails.	2	09-07-2022		
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	16-07-2022		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	23-07-2022		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	30-07-2022		
13.	Lab Internal Exam	2	06-08-2022		

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
PSO 2	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
PSO 3	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mrs. T. Vineetha	Dr. K. Naga Prasanthi	Dr. Y. Vijay Bhaskar Reddy	Dr. D. Veeraiah
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr Pawel Veliventi
Course Name & Code **:** Professional Communication-II (20FE02)
L-T-P Structure **:** 2-0-0 **Credits:** 2
Program/Sem/Sec : CSE/II/C **A.Y.:** 2021-22
PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, reading &writing skills

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words contextually
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context
CO5	Write well structured essays, reports & resumé

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1		3		2			3	3		2			
CO2		1		3		2			3	3		2			
CO3		1		3		2			3	3		2			
CO4		1		3		2			3	3		2			
CO5		1		3		2			3	3		2			
1 - Low				**2 –**Medium							**3 -** High				

TEXTBOOKS:

T1 Prabhavati.Y&etal, "English All Round–Communication Skills for Undergraduate Learners", Orient BlackSwan, Hyderabad, 2019
T2 "The Great Indian Scientists", Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

R1 Swan,M., "Practical English Usage", Oxford University Press, 2016
R2 Kumar,S and Latha, P, "Communication Skills", Oxford University Press, 2018
R3 Rizvi Ashraf M.,"EffectiveTechnical Communication",TataMcGrawHill, NewDelhi, 2008
R4 Baradwaj Kumkum, "Professional Communication" ,I.K.International Publishing House Pvt. Lt.d, NewDelhi, 2008
R5 Wood,F.T., "Remedial English Grammar", Macmillan, 2007

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Fabric of Change

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	H.G. Wells and the Uncertainties of Progress	1	2-5-22		TLM1	
2.	Studying the use of Graphic elements in texts	1	6-5-22		TLM1	
3.	Quantifying Expressions	1	9-5-22		TLM2	
4.	Adjectives and Adverbs	1	13-5-22		TLM2	
5.	Comparing and Contrasting	1	16-5-22		TLM3	
6.	Degrees of Comparison	1	20-5-22		TLM1	
7.	Information Transfer	1	23-5-22		TLM2	
No. of classes required to complete UNIT-I: 7				**No. of classes taken:**		

UNIT-II: Tools for Life

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Leaves from the Mental Portfolio of a Eurasian	1	27-5-22		TLM1	
9.	Global Comprehension & Detailed Comprehension	1	30-5-22		TLM1	
10.	Active & Passive Voice	1	3-6-22		TLM2	
11.	Idioms & Phrases	1	6-6-22		TLM1	
12.	Structured Essays using suitable claims and evidences	1	10-6-22		TLM2	
No. of classes required to complete UNIT-II: 5				**No. of classes taken:**		

UNIT-III: Homi Jahangir Bhabha

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Homi Jahangir Bhabha	2	13-6-22 & 17-6-22		TLM1	
14.	Words Often Confused	1	27-6-22		TLM1	
15.	Common Errors	1	1-7-22		TLM2	
16.	Incident & Investigation Reports	1	4-7-22		TLM2	
No. of classes required to complete UNIT-III: 5				**No. of classes taken:**		

UNIT-IV: Jagadish Chandra Bose

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Jagadish Chandra Bose	2	8-7-22 & 11-7-22		TLM1	
18.	Use of Antonyms	1	15-7-22		TLM1	
19.	Correction of Sentences	1	18-7-22		TLM3	
20.	Dialogue Writing	1	22-7-22		TLM1	
No. of classes required to complete UNIT-IV:5				**No. of classes taken:**		

UNIT-V: Prafulla Chandra Ray

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Prafulla Chandra Ray	2	25-7-22 & 29-7-22		TLM2	
22.	Analogy	2	1-8-22 & 5-8-22		TLM1	
23.	Sentence Completion	1	8-8-22		TLM2	
24.	Writing Résumé	1	12-8-22		TLM2	
No. of classes required to complete UNIT-V: 5				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs
PSO 3	To inculcate an ability to analyze, design and implement database applications

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr Pawel Veliventi**	**Dr B Samrajya Lakshmi**	**Dr B Samrajya Lakshmi**	**Dr A Ramireddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM/SEM/SEC : I B. Tech., II-Sem., CSE-C
ACADEMIC YEAR : 2021-22
COURSE NAME & CODE : Linear algebra & Transformation Techniques&20FE04
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. K.Bhanu Lakshmi
COURSE COORDINATOR : Dr. K. Jhansi Rani
PRE-REQUISITES : Matrices, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (Apply L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO2	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO3	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO4	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
CO5	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**			
1 - Low			**2** –Medium							**3** - High					

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, " Elementary Differential Equations" , 7th Edition, John Wiley & sons, New Delhi,2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	02/05/22		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to the course, Course Outcomes	1	06/05/22		TLM1	
3.	Introduction to UNIT I	1	07/05/22		TLM1	
4.	Echelon form of a matrix	1	09/05/22		TLM1	
5.	Normal form of a matrix	1	10/05/22		TLM1	
6.	Normal form of a matrix	1	13/05/22		TLM1	
7.	PAQ form	1	14/05/22		TLM1	
8.	Solution of Homogeneous linear system of equations	1	16/05/22		TLM1	
9.	Solution of Non homogeneous Linear system of equations	1	17/05/22		TLM1	
10.	Solution of Non homogeneous Linear system of equations	1	20/05/22		TLM1	
11.	**Tutorial 1**	1	21/05/22		TLM3	
12.	Solution of homogeneous Linear system of equations	1	23/05/22		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	24/05/22		TLM1	
14.	Eigen values of a matrix	1	27/05/22		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	28/05/22		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	30/05/22		TLM1	
17.	Properties (PPT)	1	31/05/22		TLM2	
18.	Properties(PPT)		03/06/22			
19.	Cayley – Hamilton Theorem.	1	04/06/22		TLM2	
20.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	06/06/22		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	07/06/22		TLM1	
22.	**Tutorial 2**	1	10/06/22		TLM3	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	11/06/22		TLM2	
24.	Standard forms of Laplace Transforms.	1	13/06/22		TLM1	
25.	Linear Property, Shifting Theorem.	1	14/06/22		TLM1	
26.	Change of scale property, Multiplication by t.	1	17/06/22		TLM1	

27.	Multiplication by t.	1	18/06/22		TLM1	
II MID EXAMINATIONS (20-06-2022 TO 25-06-2022)						
28.	Division by t	1	27/06/22		TLM1	
29.	Transforms of derivatives	1	28/06/22		TLM 1	
30.	Transforms integrals.	1	01/07/22		TLM1	
31.	**Tutorial 3**	1	02/07/22		TLM3	
32.	Unit step function and Dirac's delta function.	1	04/07/22		TLM1	
33.	Application of Laplace Transforms(PPT)	1	05/07/22		TLM2	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to UNIT IV.	1	08/07/22		TLM1	
35.	Linear property.	1	09/07/22		TLM1	
36.	Shifting properties.	1	11/07/22		TLM1	
37.	Inverse Laplace transform by using partial fractions.	1	12/07/22		TLM1	
38.	Inverse Laplace transform by using partial fractions.	1	15/07/22		TLM1	
39.	Inverse Laplace Transform by using Convolution theorem.	1	16/07/22		TLM1	
40.	Inverse Laplace Transform by using Convolution theorem.	1	18/07/22		TLM1	
41.	Solving of Ordinary differential equation by Laplace transform method.(PPT)	1	19/07/22		TLM2	
42.	Solving of Ordinary differential equation by Laplace transform method. (PPT)	1	22/07/22		TLM2	
43.	**Tutorial 4**	1	23/07/22		TLM3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Z- Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction to UNIT V.	1	25/07/22		TLM1	
45.	Standard forms of Z- Transform.	1	26/07/22		TLM1	
46.	Damping rule	1	29/07/22		TLM1	
47.	Shifting Rule	1	30/07/22		TLM1	
48.	Initial and final value theorems	1	01/08/22		TLM1	
49.	Inverse Z – Transfroms by using partial fractions.	1	02/08/22		TLM1	
50.	Inverse Z – Transformation by using convolution theorem.	1	05/08/22		TLM1	
51.	Solving of Difference equations by using Z – Transforms. (PPT)	1	06/08/22		TLM2	
52.	Solving of Difference equations by using Z – Transforms. (PPT)	1	08/08/22		TLM2	
53.	**Tutorial 5**	1	12/08/22		TLM3	
No. of classes required to complete UNIT-V:10				**No. of classes taken:**		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Solving of PDE other methods	1	13/08/22		TLM5	

II MID EXAMINATIONS (15-08-2022 TO 20-08-2022)

Teaching Learning Methods

TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. K.Bhanu Lakshmi**	**Dr. K. Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry&20FE06
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/IIsem-CSE-C **A.Y. :** 2021-22

PREREQUISITE: Electrode potential, Cell potential of a cell/EMF of a cell, primary & secondary batteries, isotropy and anisotropy in crystals, qualitative and quantitative analysis.

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications.
CO2	Apply principles of corrosion for design and effective maintenance of various equipment.
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicir
CO4	Identify the importance of liquid crystals, polymers in advanced technologies.
CO5	Apply the principles of analytical techniques in chemical analysis.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1		2	2					2
CO2	3	2	2	1		2	1					2
CO3	3	2	2	1		1	1					2
CO4	3	2	2	1		1	1					2
CO5	3	2	1	1		1	1					2

TEXTBOOKS:

T1 Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.

T2 Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16th Edition, 2015.

REFERENCE BOOKS:

R1 Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015.

R2 S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010.

R3 Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1st Edition, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ELECTRO CHEMISTRY & BATTERIES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Cos	1	04-05-2022		TLM1	
2.	Introduction to Unit-I	1	05-05-2022		TLM1	
3.	Applications of Electro chemical Series,	1	06-05-2022		TLM1	
4.	Calculation of EMF of Cell,	1	10-05-2022		TLM1	
5.	Practice exercises on applications of Electro chemical series,	1	11-05-2022		TLM1	
6.	Glass Electrode	1	12-05-2022		TLM1	
7.	Calomel Electrode, Nernst equation derivation	1	13-05-2022		TLM1	
8.	Applications of Nernst Equation	1	17-05-2022		TLM1	
9.	Lead-acid Battery	1	18-05-2022		TLM1	
10.	Lithium-ion Battery	1	19-05-2022		TLM1	
11.	$H_2 - O_2$ Fuel cell, Mg-Cu reserve battery.	1	20-05-2022		TLM1	
12.	Revision of unit 1	1	24-05-2022		TLM1	
13.	**Assignment**		25-05-2022		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, Examples,dry corrosion	1	26-05-2022		TLM1	
2.	corrosion by other gases and liquid metal corrosion dry corrosion, pilling bed worth rule.	1	27-0-2022		TLM1	
3.	Coditions to occur wet corrosion.Mechanism-oxygen absorption, hydrogen evolution, types of wet corrosion	1	31-05-2022		TLM1	
4.	Galvanic Corrosion, passivity and Galvanic series.	1	01-06-2022		TLM1	
5.	Concentration Cell Corrosic	1	02-06-2022		TLM1	
6.	Factors influencing corrosionNature of metal, Nature of environment	1	03-06-2022		TLM1	
7.	Cathodic Protection	1	07-06-2022		TLM1	
8.	Electroplating, metal cladding.	1	08-06-2022		TLM1	
9.	Revision	1	09-06-2022			
10.	**Assignment**	1	10-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials,	1	14-06-2022		TLM1	
2.	Gas-Phase Synthesis of nanomaterials, Applications.	1	15-06-2022			
3.	Materials in Electronic devices	1	16-06-2022		TLM1	
4.	Contd.. Materials in Electronic devices	1	17-06-2022		TLM1	
5.	Discussion on MID-I marks evaluation		28-06-2022			
6.	Characteristics of Molecular motors and machines	1	29-06-2022		TLM1	
7.	Rotaxanes and Catenanes as artificial molecular machines	1	30-06-2022		TLM1	
8.	Contd..rotaxanes and Catenanes as artificial	1	01-07-2022		TLM1	

	molecular machines					
9.	Automated light powered molecular motor	1	05-07-2022		TLM1	
10.	**Assignment**	1	06-07-2022		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: LIQUID CRYSTALS & POLYMERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Classification of liquid crystals	1	07-07-2022		TLM1	
2.	Applications of liquid crystals.	1	08-07-2022		TLM1	
3.	Introduction and types of polymrerisations,	1	12-07-2022		TLM1	
4.	Plastics	1	13-07-2022		TLM1	
5.	Rubbers	1	14-07-2022		TLM1	
6.	Conducting polymers.	1	15-07-2022		TLM1	
7.	Bio-degradable polymers	1	19-07-2022		TLM1	
8.	Revision	1	20-07-2022			
9.	**Assignment**	1	21-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 9				No. of classes taken:		

UNIT-V: ANALYTICAL TECHNIQUES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of analysis	1	22-072022		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	1	26-07-2022		TLM1	
3.	Strong acid vs weak base titrations.	1	27-07-2022		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	28-07-2022		TLM1	
5.	Principle of potentiometry Acid-base titration.	1	29-07-2022		TLM1	
6.	Determination of iron by using thiocynate reagent.	1	02-08-2022		TLM1	
7.	Colorimetry, Principle determination of iron by thiocynate as a reagent.	1	03-08-2022		TLM1	
8.	Revision	1	04-08-2022			
9.	Assignment	1	05-08-2022			
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

Topics beyond the syllabus:

Sl.No	Topics to be coverd	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign
1.	Batteries used in mobile phones of popular companies.	1	09-08-2022		TLM1	
2.	Industrial applications of electroplating .	1	10-08-2022		TLM1	
3.	Revision on overall syllabus.	1	11-08-2022		TLM2	
4.	Discussion on previous papers.	1	12-08-2022		TLM2	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.K.Jamili Reddy	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Shaik Johny Basha
Course Name & Code : Python Programming (20CS05)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech. – CSE / II Sem / C A.Y. : 2021 – 22

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	-	1	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO4	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO5	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
1 – Low						**2 –** Medium							**3 –** High		

TEXTBOOKS:

T1: Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford Publications

T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

R1: Gowrishankar S and Veena A, "Introduction to Python Programming", CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK

R2: R. Nageswara Rao, "Core python programming", Dreamtech, 2017.

R3: Y. Daniel Liang, "Revel for Introduction to Python Programming and Data Structures", Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	1	04/05/22			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	1	05/05/22			
3.	Python Built-in Types, Variables, Indentation	1	07/05/22			
4.	Input-Output Statements	1	10/05/22			
5.	Identifiers, Keywords, Literals, Simple Programs	1	11/05/22			
6.	Operators in Python	1	12/05/22			
7.	Operator Precedence, Programming Examples	1	14/05/22			
8.	Conditional Statements – if, if-else, Nested If-else	1	17/05/22			
9.	Python Loops – While loop, while loop with else, sample programs	1	18/05/22			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	19/05/22			
11.	Jumping Statements – continue, break, pass	1	21/05/22			
12.	Mathematical functions & constants, Random Number functions	1	24/05/22			
No. of classes required to complete UNIT – I: 12				**No. of classes taken:**		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	**List:** Basics of List, Creating and Accessing Elements	1	25/05/22			
14.	Updating Lists & Deleting Lists, Sample Programs	1	26/05/22			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	28/05/22			
16.	Operations on Matrices	1	31/05/22			
17.	Built-in List Functions	1	01/06/22			
18.	**Tuples:** Basics of Tuples, Creating and Deleting elements in a Tuple	1	02/06/22			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	04/06/22			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	07/06/22			
21.	**Sets:** Basics of Sets, Operations on sets, Sample Programs	1	08/06/22			
22.	**Dictionaries:** Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	09/06/22			
23.	Dictionary Properties & Functions	1	11/06/22			
No. of classes required to complete UNIT – II: 11				**No. of classes taken:**		

UNIT – III: Functions, Modular Design & Exception Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**Functions:** Basics of Function, Defining and Calling a function, Sample Programs	1	14/06/22			
25.	Types of functions, Function Arguments, Anonymous functions	1	15/06/22			
26.	Global and Local variables, Sample Programs	1	16/06/22			
27.	Recursion, Sample Programs	1	18/06/22			
28.	**Modular Design:** Introduction to Modules, creating a Module, import statement	1	28/06/22			
29.	from statement, Date and Time Module	1	29/06/22			
30.	Programs on Modules	1	30/06/22			
31.	Exception Handling: Basics of Exception, except clause, try clause	1	02/07/22			
32.	Finally clause and User Defined Exceptions	1	05/07/22			
No. of classes required to complete UNIT – III: 09				**No. of classes taken:**		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	**Strings:** Basics of Strings, Slicing, Escape Characters	1	06/07/22			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	1	07/07/22			
35.	Built-in string methods	1	09/07/22			
36.	Programs on Strings	1	12/07/22			
37.	**Regular Expressions:** Using Special Characters, Regular Expression Methods	1	13/07/22			
38.	Named Groups in Python RegEx, glob Module	1	14/07/22			
39.	Programs on Regular Expressions	1	16/07/22			
40.	**Files:** Basics of File, Creating files	1	19/07/22			
41.	Operation on files – Read, Write and Search	1	20/07/22			
No. of classes required to complete UNIT – IV: 09				**No. of classes taken:**		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	21//07/22			
43.	Introduction to Classes	1	23/07/22			
44.	Programming Examples	1	26/07/22			
45.	Self-Variable, Methods	1	27/07/22			

46.	Constructor Method	1	28/07/22			
47.	Inheritance	1	30/07/22			
48.	Programs on Inheritance	1	02/08/22			
49.	Overriding Methods	1	03/08/22			
50.	Data Hiding	1	04/08/22			
51.	Programs on Overriding and Data Hiding	1	06/08/22			
No. of classes required to complete UNIT – V: 10				**No. of classes taken:**		

Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	Introduction to NumPy	1	10/08/22			
53.	Introduction to Pandas	1	11/08/22			
54.	Basic Operations using NumPy and Pandas	1	13/08/22			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment – I (Units-I, II & UNIT-III (Half of the Syllabus))	A1 = 5
I – Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1 = 15
I – Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1 = 10
Assignment – II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2 = 5
II – Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2 = 15
II – Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2 = 10
Mid Marks = 80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. Shaik Johny Basha**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **S. SRINIVASA REDDY**
Course Name & Code **: DATA STRUCTURES & 20CS03**
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech. /II/C-sec **A.Y.:** 2021-22

PREREQUISITE: Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations. **(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving. (**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time. **(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees. (**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques. (**Understand - L2**)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**											**3**		
CO2	**3**	**1**											**3**		
CO3	**3**	**2**											**2**		
CO4	**3**	**1**											**3**		
CO5	**3**	**1**											**1**		
1 - Low					**2** –Medium							**3** - High			

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	02-05-2022		TLM1	
2.	Classification of Data Structures	1	04-05-2022		TLM1	
3.	Introduction to Algorithm	1	07-05-2022		TLM1	
4.	Algorithm Analysis	2	09-05-2022		TLM1	
5.	Asymptotic Notations	1	10-05-2022		TLM1	
6.	List using Arrays	1	11-05-2022		TLM1	
7.	Single Linked List	3	14-05-2022 16-05-2022 17-05-2022		TLM1	
8.	Double Linked List	3	18-05-2022 21-05-2022 23-05-2022		TLM1	
9.	Circular Linked List	2	24-05-2022 25-05-2022		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	28-05-2022		TLM2	
11.	STACKS USING ARRAYS	1	30-05-2022		TLM1	
12.	STACKS USING LINKED LIST	1	31-05-2022		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	01-06-2022 & 04-06-2022		TLM1	
14.	POSTFIX EVALUTION	1	06-06-2022		TLM1	
15.	CHECKING BALANCED PARANTHESIS, QUEUE	1	07-06-2022		TLM1	
16.	QUEUE USING ARRAY & LINKED LIST	1	08-06-2022		TLM1	
17.	CIRCULAR QUEUE,	1	11-06-2022		TLM1	
18.	DEQUE	1	13-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: SORTING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Bubble sort	1	14-06-2022		TLM2	

20.	Insertion Sort	1	15-06-2022		TLM1	
21.	Selection Sort	1	18-06-2022		TLM1	
22.	Merge Sort	2	27-06-2022 & 28-06-2022		TLM1	
23.	Quick Sort	2	29-06-2022 & 02-07-2022		TLM1	
24.	Heap Sort	2	04-07-2022 & 05-07-2022		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Introduction to Trees	1	06-07-2022		TLM1	
26.	Binary Trees, Tree Traversals	2	09-07-2022 & 11-07-2022		TLM1	
27.	Binary Trees Implementation	1	12-07-2022		TLM2	
28.	Binary Search Trees	2	13-07-2022 & 16-07-2022		TLM1	
29.	AVL Trees	1	18-07-2022		TLM1	
30.	Operations & Examples	2	19-07-2022 & 20-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 09				**No. of classes taken:**		

UNIT-V: GRAPHS & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	GRAPHS, FUNDAMENTALS	1	23-07-2022		TLM1	
32.	REPRESENTATION OF GRAPHS	1	25-07-2022		TLM1	
33.	BFS	2	26-07-2022, 27-07-2022		TLM1	
34.	DFS	2	30-07-2022, 01-08-2022		TLM1	
35.	Hashing Introduction,	1	02-08-2022		TLM1	
36.	Hash function, separate Chaining	2	03-08-2022, 06-08-2022		TLM1	
37.	Linear & Quadratic Probing	2	08-08-2022, 09-08-2022		TLM1	
38.	Double & Rehasing	1	10-08-2022		TLM2	
39.	Revision	1	13-08-2022		TLM1	
40.	Revision	1	13-08-2022		TLM1	
41.	Revision	1	13-08-2022		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. S. Srinivasa Reddy**	**Mr. A. S. R. C. Murthy**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF CSE-C.Section

COURSE HANDOUT

PART-A

Name of Course Instructor : **Dr.V.V.NARSI REDDY**
Course Name & Code : CONSTITUTION OF INDIA (20MC01)

L-T-P Structure : 2-0-0 Credits : 0
Program/Sem : B.Tech., CSE-C.section., II-Sem., A.Y: 2021-22

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive ,Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commission and the process and about SC,ST,OBC and women.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

T1: Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi
T2: Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

R1: Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.
R2: Subash Kashyap, Indian Constitution, National Book Trust.

R3 J.A. Siwach, Dynamics of Indian Government and Politics.

R4 D.C. Gupta, Indian Government and Politics.

R5 H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).
R6 J.C. Johari, Indian Government and Politics Hans.

R7 J.Raj, Indian Government and Politics.

R8 M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.
R9 Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E- RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I : Introduction to Indian Constitution

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
1.	Introduction and Co-Po and Syllabus	1	02-05-2022		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	05-05-2022		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	09-05-2022		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	12-05-2022		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	16-05-2022		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	19-05-2022		TLM2	CO1	T1 / T2	
7.	Assignment -I	1	23-05-2022		TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		**7**			**No. of classes taken:**			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	26-05-2022		TLM2	CO2	T1 / T2	
9	Federalism Centre	1	30-05-2022		TLM2	CO2	T1 / T2	
10	State Relationships to the Union	1	02-06-2022		TLM2	CO2	T1 / T2	
11	President Role, Power and Position	1	06-06-2022		TLM2	CO2	T1 / T2	
12	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties	1	09-06-2022		TLM2	CO2	T1 / T2	
13	Lok Sabha,Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	13-06-2022		TLM2	CO2	T1 / T2	
14	Assignment II	1	16-06-2022		TLM7	CO2	T1 / T2	
		7			**No. of classes taken:**			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	Mid-1	1	20-06-2022					
16	Mid-1	1	23-06-2022					
17	State Government and its Administration Governor and Role	1	27-06-2022		TLM2 / TLM4	CO3	T1 / T2	
18	Role of Chief Ministers and Council of Ministers	1	30-06-2022		TLM2 / TLM4	CO3	T1 / T2	
19	State Secretariat Functions	1	04-07-2022		TLM2 / TLM4	CO3	T1 / T2	
20	Organisation ,Structure and Functions of State Governments	1	07-07-2022		TLM2 / TLM4	CO3	T1 / T2	
21	Assignment –III	1	11-07-2022		TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		**07**			**No. of classes taken:**			

UNIT-IV: A Local Administration

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
22	A Local Administration	1	11-07-2022		TLM2 / TLM4	CO4	T1 / T2	
23	Role and importance of local administration	1	14-07-2022		TLM2 / TLM4	CO4	T1 / T2	
24	Municipalities –Mayor and Role of Elected Representative	1	18-07-2022		TLM2 / TLM4	CO4	T1 / T2	
25	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles	1	21-07-2022		TLM2 / TLM4	CO4	T1 / T2	
26	Village level-Role of Elected and Appointed officials./Assignment-IV	1	25 -07-2022		TLM2/ TLM 7	CO4	T1 / T2	
No. of classes required to complete UNIT-IV		**05**			**No. of classes taken:**			

UNIT-V: Election Commission

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27	Election Commission :Role of Chief Election Commissioner and Election Commisionerate	1	28 -07-2022		TLM2 / TLM4	CO5	T1 / T2	
28.	State Election Commission	1	01-08-2022		TLM2 / TLM4	CO5	T1 / T2	
29	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	04-08-2022		TLM2 / TLM4	CO5	T1 / T2	
30	Assignment-V	1	08-08-2022		TLM7	CO5	T1 / T2	
31	Revision	1	11-08-2022					
32	Revision	1	25-08-2022					
No. of classes required to complete UNIT-V		**06**			**No. of classes taken:**			

Content beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Consumer Rights	1			TLM2/ TLM5		T2/R3	
2.	Industrial policies							

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM 7	Assignment /Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:**The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:**To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:**The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.V.V.NARSI REDDY	Dr.V.V.NARSI REDDY	Dr.D.Veeraiah	Dr.D.Veeraiah

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry Lab&20FE53
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/IIsem/CSE-C **A.Y. :** 2020-22

Pre requisites: Nil

Course Educational Objective: This course enables the students to analyze water sample for alkalinity. perform and distinguish different types of volumetric titrations. get hands-on experience with preparation of polymers. use analytical techniques like conductometry, potentiometry and colorimetry.

Course Outcomes: After completion of the course, the students will be able to,
CO1: Assess alkalinity of water based on the procedure given.
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.
CO3: Acquire practical knowledge related to preparation of polymers.
CO4: Exhibit skills in performing experiments based on theoretical fundamentals.

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

Bos Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Engineering chemistry lab	3	07-05-2022		TLM1	CO4	
2.	Determination of amount of HCl using standard Na_2CO_3 solution	3	14-05-2022		TLM4	CO2,CO4	
3.	Determination of alkalinity of water sample.	3	21-05-2022		TLM4	CO1,CO4	
4.	Estimation of Mg+2/Zn+2/Ca+2 in given solution by using standard EDTA solution.	3	28-05-2022		TLM4	CO2, CO4	
5.	Preparation of nylon fibres.	3	04-06-2022		TLM4	CO3	
6.	Preparation of Bakelite	3	11-06-2022		TLM4	CO3	
7.	Estimation of Mohr's salt by using potassium permanganate.	3	18-06-2022		TLM4	CO2	
8.	Estimation of ferrous ion by using potassium dichromate.	3	02-07-2022		TLM4	CO2	
9.	Determination of pH of the given sample solution using pH meter	3	16-07-2022		TLM4	CO4	
10.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	23-07-2022		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using NH4OH solution.	3	30-07-2022		TLM4	CO2,CO4	
12.	Estimation of amount of HCl potentiometrically using NaOH solution.	3	06-08-2022		TLM4	CO2, CO4	

13.	Internal lab exam	3	13-08-2022			C02, CO4	
Total							

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part - C

EVALUATION PROCESS:

According to Academic Regulations of R20 Distribution and Weightage of Marks For Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		Marks
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		**15 Marks**

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.K.Jamili Reddy**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Shaik Johny Basha

Course Name & Code : Python Programming Lab (20CS54)

L-T-P Structure : 0-0-3 Credits : 1.5

Program/Sem/Sec : B.Tech. – CSE / II Sem / C A.Y. : 2021 – 22

PRE-REQUISITE: Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Apply building blocks of Python in solving computational problems.	Apply – Level 3
CO2:	Implement in-built data structures available in Python to solve computational problems.	Apply – Level 3
CO3:	Implement modular programming, string manipulations and Object-oriented programming in python.	Apply – Level 3
CO4:	Improve individual / teamwork skills, communication & report writing skills with ethical values.	---

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 – Low								**2 –** Medium					**3 –** High		

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Python IDE Installation and Basics of Python	3			DM5
2.	Language basics and example problems	6			DM5
3.	Programs on Lists	3			DM5
4.	Programs on Tuples	3			DM5
5.	Programs on Sets	3			DM5
6.	Programs on Dictionaries	3			DM5
7.	Programs on Functions and Recursion	3			DM5
8.	Programs on Date and Time Modules, Exception Handling	3			DM5
9.	Programs on Strings	3			DM5
10.	Programs on Regular Expressions	3			DM5
11.	Programs on Object-Oriented Programming	3			DM5
12.	Programs on Python Libraries – Numpy , Pandas , Matplotlib	3			DM5
13.	Internal Lab Exam	3			DM4

Delivery Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Shaik Johny Basha	Dr. M. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. D. Veeraiah
Signature				

PART-C

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. Shaik Johny Basha**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **S. Srinivas Reddy/ D. Anil Kumar/ R. Ashok**

Course Name & Code **: DATA STRUCTURES LAB & 20CS53**

L-T-P Structure **: 0-0-3** **Credits:** 1.5

Program/Sem/Sec : B.Tech/II/B-Sec. **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)

CO2: Implement Various Sorting Techniques. (**Apply - L3**)

CO3: : Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction & List using Arrays	3	06-05-2022		
2.	Linked List Programs	12	13-05-2022, 20-05-2022 27-05-2022 03-06-2022		
3.	Stack, Queue Using Arrays, Linked List	6	10-06-2022 17-06-2022		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	24-06-2022		
5.	Circular Queue Double Ended Queue	3	01-06-2022		
6.	Bubble sort Selection sort Insertion sort	3	08-07-2022		
7.	Merge sort Quick sort	3	15-07-2022		
8.	Heap sort Binary Tree	3	22-07-2022		
9.	Binary Search Tree	3	29-07-2022		
10.	BFS,DFS	3	05-08-20222		
11.	Lab Internal Exam	3	12-08-2022		

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. S. R. C. Murthy**	**Mr. A. S. R. C. Murthy**	**Dr. Y.V. B. Reddy**	**Dr. D. Veeriah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : BAJJURI USHA RANI
Course Name & Code : SHELL SCRIPTING LAB & 20CS55
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., CSE., II-Sem., Section- C A.Y : 2021-22

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	-	2	3	-	-
CO2	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO3	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

REFERENCE BOOKS:

R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656

R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. GilbergPublisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256

R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - C

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**Module – I:** Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	05-05-2022		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	12-05-2022		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	19-05-2022		
4.	**Module–II: Introduction to Shell-** Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments, Basic Operators	2	26-05-2022		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	02-06-2022		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	09-06-2022		
7.	**Module – III:** Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	16-06-2022		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	30-06-2022		

9.	Commands related to inode, I/O redirection and piping, process control commands, mails.	2	07-07-2022		
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	14-07-2022		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	21-07-2022		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	28-07-2022		
13.	Lab Internal Exam	2	04-08-2022		

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
PSO 2	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
PSO 3	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mrs. B. Usha Rani	Dr. K. Naga Prasanthi	Dr. Y. Vijay Bhaskar Reddy	Dr. D. Veeraiah
Signature				

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE &MACHINE LEARNING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr B.SAGAR
Course Name & Code : PC-II, 20FE02
L-T-P Structure : **2-0-0** **Credits:** 02
Program/Sem/Sec :AI&ML–II SEM
A.Y. : 2021-22

PREREQUISITE : **NIL**

COURSE EDUCATIONAL OBJECTIVES (CEOs): To improve English language proficiency of the students on various aspects like vocabulary, grammar, communication skills, listening skills, Reading & Writing skills.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Produce a coherent paragraph interpreting a figure/graph/chart/table.	L2
CO2	Comprehend the given texts thoroughly by guessing the meanings of the words Contextually.	L2
CO3	Use language appropriately for describing/comparing/contrasting/giving directions & suggestions.	L1
CO4	Write formal/informal dialogues with an understanding of verbal/non-verbal features of communication. Guess meanings of the words from the context.	L2
CO5	Write well structured essays; Reports &Résumé.	L3

UNIT-I

Fabric of Change-'H.G. Wells and the Uncertainties of Progress–Peter J. Bowler'; Reading: Studying the use of Graphic elements in texts; Grammar & Vocabulary**:** Quantifying Expressions; Adjectives and adverbs; Comparing and Contrasting; Degrees of Comparison; Writing: Information Transfer.

UNIT-II

Tools for Life - 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';

Reading: Global Comprehension; Detailed Comprehension; Grammar & Vocabulary**:** Active & Passive Voice; Idioms & Phrases; Writing: Structured Essays using suitable claims and evidences.

UNIT-III

'Homi Jahangir Bhabha'; Grammar & Vocabulary: Words often confused; Common Errors; Writing**:** Incident & Investigation Reports.

UNIT-IV

'Jagadish Chandra Bose'; Grammar & Vocabulary: Use of antonyms; Correction of Sentences; Writing**:** Dialogue Writing.

UNIT-V

'**Prafulla Chandra Ray'**; Grammar & Vocabulary: Analogy; Sentence Completion; Writing**:** Writing a Résumé

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1		1		1			3	3		2			
CO2		1		1		1			3	3		2			
CO3		1		1		1			3	3		2			
CO4		1		1		1			3	3		2			
CO5		1		1		1			3	3		2			
1 - Low					**2 –**Medium						**3 -** High				

TEXTBOOKS:

T1 Prabhavati. Y & etal , "English All Round –Communication Skills for Undergraduate Learners" ,Orient Black Swan, Hyderabad, 2019

T2 "The Great Indian Scientists" published by Cengage Learning India Pvt. Ltd., Delhi, 2017

REFERENCE BOOKS:

R1 Swan, M., "Practical English Usage", Oxford University Press, 2016.

R2 Kumar, Sand Latha, P, "Communication Skills", Oxford University Press, 2018.

R3 Rizvi Ashraf M.,"Effective Technical Communication", Tata Mc Graw Hill, NewDelhi, 2008.

R4 Baradwaj Kumkum, "Professional Communication",I. K. International PublishingHousePvt.Lt.,NewDelhi,2008.

R5 Wood, F. T., "Remedial English Grammar" , Macmillan, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	01	4-5-2022		TLM2	
2.	**Fabric of Change-**'H.G. Wells and the Uncertainties of Progress– Peter J. Bowler'	01	7-5-2022		TLM2	
3.	Reading: Studying the use of Graphic elements in texts;	01	11-5-2022		TLM2	
4.	Quantifying Expressions; Comparing and Contrasting	01	14-5-2022		TLM2	
5.	Adjectives and adverbs	01	18-5-2022		TLM2	
6.	Degrees of Comparison	01	21-5-2022		TLM2	
7.	Writing: Information Transfer.	01	25-5-2022		TLM2 TLM6	
No. of classes required to complete UNIT-I: 07				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	**Tools for Life -** 'Leaves from the Mental Portfolio of a Eurasian – Sui Sin Far';	01	28-5-2022		TLM2	
9.	Reading: Global Comprehension & Detailed Comprehension	01	1-6-2022		TLM2	
10.	Active & Passive Voice	01	4-6-2022		TLM2	
11.	Idioms & Phrases	01	8-6-2022		TLM2	
12.	Essay Writing - Structured Essays using suitable claims and evidences	01	11-6-2022		TLM2 TLM6	
No. of classes required to complete UNIT-II: 05				**No. of classes taken:**		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly

13.	**'Homi Jahangir Bhabha'**	02	15-06-2022 18-6-2022		TLM2 TLM6	
14.	Words often confused	01	29-6-2022		TLM2	
15.	Common Errors	01	2-7-2022		TLM2	
16.	Report Writing – Types & Formats	01	6-7-2022		TLM2	
17.	Incident and Investigation Reports	01	9-7-2022		TLM2 TLM6	
No. of classes required to complete UNIT-III: 06				**No. of classes taken:**		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	**Jagadish Chandra Bose**	01	13-7-2022		TLM2 TLM2	
19.	Use of antonyms	01	16-7-2022		TLM2	
20.	Correction of Sentences	01	20-7-2022		TLM2	
21.	Formal and Informal dialogues	01	23-7-2022		TLM2	
22.	Dialogue Writing.	01	27-7-2022		TLM2 TLM6	
No. of classes required to complete UNIT-IV: 05				**No. of classes taken:**		

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	**Prafulla Chandra Ray**	01	30-7-2022		TLM2	
24.	Analogy	01	3-8-2022		TLM2	
25.	Sentence Completion	01	6-8-2022		TLM2	
26.	Resume - Formats	01	10-8-2022		TLM2	
27.	Writing a Résumé	01	13-8-2022		TLM2 TLM6	
No. of classes required to complete UNIT-V: 05				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5

II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr B.SAGAR**	**Dr. B. Samrajya Lakshmi**	**Dr. B. Samrajya Lakshmi**	**Dr. A. Ramireddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & MACHINE LEARNING

COURSE HANDOUT

PART-A

Name of Course Instructor: D. VIJAY KUMAR
Course Name & Code **:** Linear algebra & Transformation Techniques&20FE04
L-T-P Structure **:** 2-1 -0 **Credits:3**
Program/Sem/Sec : I B.Tech/II sem/B **A.Y.:** 2020 - 21

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra. also students introduced to integral transformation which includes Laplace transformation and Z – Transformations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Investigate the consistency of the system of equations and solve them.
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem.
CO3	Use the concepts of Laplace transforms to various forms of functions.
CO4	Solve Ordinary differential equations by using Laplace Transformations.
CO5	Apply Z- Transformations to solve difference equations.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	-	-	-	-	-	-	1			
CO2	3	2	-	2	-	-	-	-	-	-	-	1			
CO3	3	2	-	2	-	-	-	-	-	-	-	1			
CO4	2	1	-	1	-	-	-	-	-	-	-	1			
CO5	3	2	-	2	-	-	-	-	-	-	-	1			
1 - Low						**2 –**Medium						**3 -** High			

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1st Edition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, " Elementary Differential Equations" , 7th Edition, John Wiley & sons, New Delhi,2011.

R4 S. S. Sastry, " Introductory Methods of Numerical Analysis" 5th Edition, PHI Learning Private

Limited, New Delhi, 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	02/05/22		TLM1	
2.	Introduction to UNIT I	1	04/05/22		TLM2	
3.	Echelon form of a matrix	1	05/05/22		TLM1	
4.	Echelon form of a matrix	1	06/05/22		TLM1	
5.	Normal form of a matrix	1	09/05/22		TLM1	
6.	Normal form of a matrix	1	11/05/22		TLM1	
7.	PAQ form	1	12/05/22		TLM1	
8.	Solution of Homogeneous linear system of equations	1	13/05/22		TLM1	
9.	**Tutorial 1**	1	16/05/22		TLM3	
10.	Solution of Non homogeneous Linear system of equations	1	18/05/22		TLM1	
11.	Solution of Non homogeneous Linear system of equations	1	19/05/22		TLM1	
12.	Solution of Non homogeneous Linear system of equations	1	20/05/22		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	23/05/22		TLM2	
14.	Eigen values of a matrix	1	25/05/22		TLM1	
15.	Eigen values and Eigen vectors of a matrix	1	26/05/22		TLM1	
16.	Eigen values and Eigen vectors of a matrix	1	27/05/22		TLM1	
17.	Properties	1	30/05/22		TLM1	
18.	Properties		01/06/22			
19.	Cayley – Hamilton Theorem	1	02/06/22		TLM1	
20.	**TUTORIAL 2**	1	03/06/22		TLM3	
21.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	06/06/22		TLM1	
22.	Inverse and powers of a matrix by using Caley – Hamilton Theorem	1	08/06/22		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Laplace Transformation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	09/06/22		TLM2	
24.	Standard forms of Laplace Transformations	1	10/06/22		TLM1	
25.	Linear Property, Shifting Theorem	1	13/06/22		TLM1	

26.	Change of scale property, Multiplication by t	1	15/06/22		TLM1	
27.	Multiplication by t	1	16/06/22		TLM1	
28.	**Tutorial - 3**	1	17/06/22		TLM3	
29.	Division by t	1	27/06/22		TLM 1	
30.	Transformation derivatives and Integrals	1	29/06/22		TLM1	
31.	Transformation integrals	1	30/06/22		TLM1	
32.	Unit step function and Dirac's delta function	1	01/07/22		TLM1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT-IV: Inverse Laplace Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction to UNIT IV	1	04/07/22		TLM1	
34.	Linear property	1	06/07/22		TLM1	
35.	Shifting properties	1	07/07/22		TLM1	
36.	Inverse Laplace transformation by using partial fractions	1	08/07/22		TLM1	
37.	Inverse Laplace transformation by using partial fractions	1	11/07/22		TLM1	
38.	Inverse Laplace Transformation by using Convolution theorem	1	13/07/22		TLM1	
39.	Inverse Laplace Transformation by using Convolution theorem	1	14/07/22		TLM3	
40.	**TUTORIAL 4**	1	15/07/22		TLM1	
41.	Solving of Ordinary differential equation by Laplace transform method	1	18/07/22		TLM1	
42.	Solving of Ordinary differential equation by Laplace transform method	1	20/07/22		TLM3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Z- Transformations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction to UNIT V	1	21/07/22		TLM1	
44.	Standard forms of Z-Transformation	1	22/07/22		TLM1	
45.	Damping rule	1	25/07/22		TLM1	
46.	Shifting Rule	1	27/07/22		TLM1	
47.	Initial and final value theorems	1	28/07/22		TLM1	
48.	Inverse Z – Transformations	1	29/07/22		TLM1	
49.	Inverse Z – Transfroms by using partial fractions	1	30/07/22		TLM1	
50.	Inverse Z – Transformation by using convolution theorem	1	01/08/22		TLM1	
51.	Solving of Difference equations by using Z – Transformations	1	03/08/22		TLM1	
52.	Solving of Difference equations by using Z - Transformations	1	04/08/22 05/08/22		TLM1	
53.	**TUTORIAL 5**	1	08/08/22		TLM3	
54.	Content beyond the syllabus	1	10/08/22		TLM5	

No. of classes required to complete UNIT-V:12				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**D. VIJAY KUMAR**	**Dr. K. Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr. A. Rami Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry&20FE06
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/IIsem-CSE(AI&ML)-A **A.Y. :** 2021-22

PREREQUISITE: Electrode potential, Cell potential of a cell/EMF of a cell, primary & secondary batteries, isotropy and anisotropy in crystals, qualitative and quantitative analysis.

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions. It helps to strengthen the basic concepts of electrochemistry, corrosion, nanotechnology, polymers, liquid crystals and analytical techniques

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications.
CO2	Apply principles of corrosion for design and effective maintenance of various equipment.
CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicir
CO4	Identify the importance of liquid crystals, polymers in advanced technologies.
CO5	Apply the principles of analytical techniques in chemical analysis.

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1		2	2					2
CO2	3	2	2	1		2	1					2
CO3	3	2	2	1		1	1					2
CO4	3	2	2	1		1	1					2
CO5	3	2	1	1		1	1					2

TEXTBOOKS:

T1 Shashi Chawla, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 3rd Edition, 2003.

T2 Jain, Jain, "A Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 16th Edition, 2015.

REFERENCE BOOKS:

R1 Shikha Agarwal, "A text book of Engineering Chemistry", Cambridge University Press, New Delhi, 1st Edition, 2015.

R2 S.S. Dara, S.S. Umare, "A Text book of Engineering Chemistry", S. Chand Publications, New Delhi, 12th Edition, 2010.

R3 Y. Bharathi Kumari, Jyotsna Cherukuri, "A Text book of Engineering Chemistry", VGS Publications, Vijayawada, 1st Edition, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ELECTRO CHEMISTRY & BATTERIES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Cos	1	04-05-2022		TLM1	
2.	Introduction to Unit-I	1	06-05-2022		TLM1	
3.	Applications of Electro chemical Series,	1	07-05-2022		TLM1	
4.	Calculation of EMF of Cell,	1	10-05-2022		TLM1	
5.	Practice exercises on applications of Electro chemical series,	1	11-05-2022		TLM1	
6.	Glass Electrode	1	13-05-2022		TLM1	
7.	Calomel Electrode, Nernst equation derivation	1	14-05-2022		TLM1	
8.	Applications of Nernst Equation	1	17-05-2022		TLM1	
9.	Lead-acid Battery	1	18-05-2022		TLM1	
10.	Lithium-ion Battery	1	20-05-2022		TLM1	
11.	$H_2 - O_2$ Fuel cell, Mg-Cu reserve battery.	1	21-05-2022		TLM1	
12.	Revision of unit 1	1	24-05-2022		TLM1	
13.	**Assignment**		25-05-2022		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: SCIENCE OF CORROSION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Definition, Examples,dry corrosion	1	27-05-2022		TLM1	
2.	corrosion by other gases and liquid metal corrosion dry corrosion, pilling bed worth rule.	1	28-0-2022		TLM1	
3.	Coditions to occur wet corrosion.Mechanism-oxygen absorption, hydrogen evolution, types of wet corrosion	1	31-05-2022		TLM1	
4.	Galvanic Corrosion, passivity and Galvanic series.	1	01-06-2022		TLM1	
5.	Concentration Cell Corrosic	1	03-06-2022		TLM1	
6.	Factors influencing corrosionNature of metal, Nature of environment	1	04-06-2022		TLM1	
7.	Cathodic Protection	1	07-06-2022		TLM1	
8.	Electroplating, metal cladding.	1	08-06-2022		TLM1	
9.	Revision	1	10-06-2022			
10.	**Assignment**	1	11-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: CHEMISTRY OF ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, types of nano-materials,	1	14-06-2022		TLM1	
2.	Gas-Phase Synthesis of nanomaterials, Applications.	1	15-06-2022			
3.	Materials in Electronic devices	1	17-06-2022		TLM1	
4.	Contd.. Materials in Electronic devices	1	18-06-2022		TLM1	
5.	Discussion on MID-I marks evaluation		28-06-2022			
6.	Characteristics of Molecular motors and machines	1	29-06-2022		TLM1	
7.	Rotaxanes and Catenanes as artificial molecular machines	1	01-07-2022		TLM1	
8.	Contd..rotaxanes and Catenanes as artificial	1	02-07-2022		TLM1	

	molecular machines					
9.	Automated light powered molecular motor	1	05-07-2022		TLM1	
10.	**Assignment**	1	06-07-2022		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: LIQUID CRYSTALS & POLYMERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Classification of liquid crystals	1	08-07-2022		TLM1	
2.	Applications of liquid crystals.	1	12-07-2022		TLM1	
3.	Introduction and types of polymrerisations,	1	13-07-2022		TLM1	
4.	Plastics	1	15-07-2022		TLM1	
5.	Rubbers	1	16-07-2022		TLM1	
6.	Conducting polymers.	1	19-07-2022		TLM1	
7.	Bio-degradable polymers	1	20-07-2022		TLM1	
8.	Revision	1	22-07-2022			
9.	**Assignment**	1	23-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 9				No. of classes taken:		

UNIT-V: ANALYTICAL TECHNIQUES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of analysis	1	26-072022		TLM1	
2.	Principle of conductometric titrations, strong acid vs strong base titration	1	27-07-2022		TLM1	
3.	Strong acid vs weak base titrations.	1	29-07-2022		TLM1	
4.	Strong base vs weak acid, weak acid vs weak base titrations.	1	30-07-2022		TLM1	
5.	Principle of potentiometry Acid-base titration.	1	02-08-2022		TLM1	
6.	Determination of iron by using thiocynate reagent.	1	03-08-2022		TLM1	
7.	Colorimetry, Principle determination of iron by thiocynate as a reagent.	1	05-08-2022		TLM1	
8.	Revision	1	06-08-2022			
9.	Assignment	1	09-08-2022			
No. of classes required to complete UNIT-V: 9				No. of classes taken:		

Topics beyond the syllabus:

Sl.No	Topics to be coverd	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign
1.	Batteries used in mobile phones of popular companies.	1	10-08-2022		TLM1	
2.	Industrial applications of electroplating	1	12-08-2022		TLM1	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.K.Jamili Reddy	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. T N V S Praveen
Course Name & Code : Python Programming (20CS05)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech. – CSM / II Sem / A A.Y. : 2021 – 22

PRE-REQUISITE: C Programming and Problem-Solving Skills

COURSE EDUCATIONAL OBJECTIVE (CEO): The objective of the course is to provide basic knowledge of python. Python Programming is intended for Software Engineers, System Analysts, Program Managers and User Support Personnel who wish to learn the Python Programming language for problem solving and programming capability.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to:

CO1:	Identify basic building blocks of python to solve mathematical problems.	Understand – Level 2
CO2:	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	Apply – Level 3
CO3:	Use exception-handling mechanism to catch run-time errors	Apply – Level 3
CO4:	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	Understand – Level 2
CO5:	Demonstrate object-oriented programming principles of python.	Understand – Level 2

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	-	1	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO4	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
CO5	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
1 – Low							**2 –** Medium						**3 –** High		

TEXTBOOKS:

T1: Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford Publications

T2: Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg

REFERENCE BOOKS:

R1: Gowrishankar S and Veena A, "Introduction to Python Programming", CRC Press, Taylor, and Francis Group – A CHAPMAN & HALLBOOK

R2: R. Nageswara Rao, "Core python programming", Dreamtech, 2017.

R3: Y. Daniel Liang, "Revel for Introduction to Python Programming and Data Structures", Pearson Publications.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Python, Operators & Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History, Features, and Applications of Python	1	02/05/22			
2.	Compiler vs Interpreter, Usage of Python Interpreter, Python Shell	1	05/05/22			
3.	Python Built-in Types, Variables, Indentation	1	06/05/22			
4.	Input-Output Statements	1	09/05/22			
5.	Identifiers, Keywords, Literals, Simple Programs	1	10/05/22			
6.	Operators in Python	1	12/05/22			
7.	Operator Precedence, Programming Examples	1	13/05/22			
8.	Conditional Statements – if, if-else, Nested If-else	1	16/05/22			
9.	Python Loops – While loop, while loop with else, sample programs	1	17/05/22			
10.	Python Loops – for loop, for loop with else, Nested Loops, sample Programs	1	19/05/22			
11.	Jumping Statements – continue, break, pass		20/05/22			
12.	Mathematical functions & constants, Random Number functions	1	23/05/22			
No. of classes required to complete UNIT – I: 12				**No. of classes taken:**		

UNIT – II: Lists, Tuples, Sets, and Dictionaries

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	**List:** Basics of List, Creating and Accessing Elements	1	24/05/22			
14.	Updating Lists & Deleting Lists, Sample Programs	1	26/05/22			
15.	Basic List Operations: Reverse, Indexing, and Slicing with Programs	1	27/05/22			
16.	Operations on Matrices	1	30/05/22			
17.	Built-in List Functions	1	31/05/22			
18.	**Tuples:** Basics of Tuples, Creating and Deleting elements in a Tuple	1	02/06/22			
19.	Accessing Values in a Tuple, updating tuples, Delete tuple elements	1	03/06/22			
20.	Basic Tuple Operations: Indexing, Slicing and Matrices, Built-in tuple functions	1	06/06/22			
21.	**Sets:** Basics of Sets, Operations on sets, Sample Programs	1	07/06/22			
22.	**Dictionaries:** Basics of Dictionaries, Accessing Elements in a Dictionary, Working on Dictionaries	1	09/06/22			
23.	Dictionary Properties & Functions	1	10/06/22			
No. of classes required to complete UNIT – II: 11				**No. of classes taken:**		

UNIT – III: Functions, Modular Design & Exception Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**Functions:** Basics of Function, Defining and Calling a function, Sample Programs	1	13/06/22			
25.	Types of functions, Function Arguments, Anonymous functions	1	14/06/22			
26.	Global and Local variables, Sample Programs	1	16/06/22			
27.	Recursion, Sample Programs	1	17/06/22			
28.	**Modular Design:** Introduction to Modules, creating a Module, import statement	1	27/06/22			
29.	from statement, Date and Time Module	1	28/06/22			
30.	Programs on Modules	1	30/06/22			
31.	Exception Handling: Basics of Exception, except clause, try clause	1	01/07/22			
32.	Finally clause and User Defined Exceptions	1	04/07/22			
No. of classes required to complete UNIT – III: 09				**No. of classes taken:**		

UNIT – IV: Strings, Regular Expression Operations & Files

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	**Strings:** Basics of Strings, Slicing, Escape Characters	1	05/07/22			
34.	String Special Operations, String Formatting Operator, Triple quotes, Raw string, Unicode strings	1	07/07/22			
35.	Built-in string methods	1	08/07/22			
36.	Programs on Strings	1	11/07/22			
37.	**Regular Expressions:** Using Special Characters, Regular Expression Methods	1	12/07/22			
38.	Named Groups in Python RegEx, glob Module	1	14/07/22			
39.	Programs on Regular Expressions	1	15/07/22			
40.	**Files:** Basics of File, Creating files	1	18/07/22			
41.	Operation on files – Read, Write and Search	1	19/07/22			
No. of classes required to complete UNIT – IV: 09				**No. of classes taken:**		

UNIT – V: Object Oriented Programming (OOP) in Python

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Object-Oriented Programming: Basics of OOP	1	21/07/22			
43.	Introduction to Classes	1	22/07/22			
44.	Programming Examples	1	25/07/22			
45.	Self-Variable, Methods	1	26/07/22			

46.	Constructor Method	1	28/07/22			
47.	Inheritance	1	29/07/22			
48.	Programs on Inheritance	1	01/08/22			
49.	Overriding Methods	1	02/08/22			
50.	Data Hiding	1	04/08/22			
51.	Programs on Overriding and Data Hiding	1	05/08/22			
No. of classes required to complete UNIT – V: 10				**No. of classes taken:**		

Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	Introduction to NumPy	1	08/08/22			
53.	Introduction to Pandas	1	11/08/22			
54.	Basic Operations using NumPy and Pandas	1	13/08/22			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment – I (Units-I, II & UNIT-III (Half of the Syllabus))	A1 = 5
I – Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1 = 15
I – Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1 = 10
Assignment – II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2 = 5
II – Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2 = 15
II – Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2 = 10
Mid Marks = 80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. T.N.V.S Praveen**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING(AI &ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: **A. Sudhakar**
Course Name & Code **: DATA STRUCTURES & 20CS03**
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech. /II/A **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.**(Understand - L2)**
CO2	Apply linear data structures like stack and queue in problem solving.(**Apply - L3**)
CO3	Demonstrate various sorting techniques and compare their computational complexities in terms of space and time.**(Understand - L2)**
CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.(**Understand - L2**)
CO5	Demonstrate graph traversal techniques and hashing techniques.(**Understand - L2**)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**2**											**3**		
CO2	**3**	**1**											**3**		
CO3	**3**	**2**											**2**		
CO4	**3**	**1**											**3**		
CO5	**3**	**1**											**1**		
1 - Low					**2** –Medium						**3** - High				

TEXTBOOKS:

T1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition [1,2,3 units].

T2 ReemaThareja, Data Structures using c, Oxford Publications [3,4,5].

REFERENCE BOOKS:

R1 Langson, Augenstein &Tenenbaum, 'Data Structures using C and C++', 2nd Ed, PHI.

R2 RobertL.Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2ndedition, PHI.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Data Structures	1	02-05-2022		TLM1	
2.	Classification of Data Structures	1	05-05-2022		TLM1	
3.	Introduction to Algorithm	1	07-05-2022		TLM1	
4.	Algorithm Analysis	2	09-05-2022		TLM1	
5.	Asymptotic Notations	1	10-05-2022		TLM1	
6.	List using Arrays	1	12-05-2022		TLM1	
7.	Single Linked List	3	14-05-2022 16-05-2022 17-05-2022		TLM1	
8.	Double Linked List	3	19-05-2022 21-05-2022 23-05-2022		TLM1	
9.	Circular Linked List	2	24-05-2022 26-05-2022		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	STACKS ADT	1	28-05-2022		TLM2	
11.	STACKS USING ARRAYS	1	30-05-2022		TLM1	
12.	STACKS USING LINKED LIST	1	31-05-2022		TLM1	
13.	INFIX TO POSTFIX CONVERSION	2	02-06-2022 & 04-06-2022		TLM1	
14.	POSTFIX EVALUTION	1	06-06-2022		TLM1	
15.	CHECKING BALANCED PARANTHESIS, QUEUE	1	07-06-2022		TLM1	
16.	QUEUE USING ARRAY & LINKED LIST	1	09-06-2022		TLM1	
17.	CIRCULAR QUEUE,	1	11-06-2022		TLM1	
18.	DEQUE	1	13-06-2022		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: SORTING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Bubble sort	1	14-06-2022		TLM2	
20.	Insertion Sort	1	16-06-2022		TLM1	
21.	Selection Sort	1	18-06-2022		TLM1	
22.	Merge Sort	2	27-06-2022 & 28-06-2022		TLM1	
23.	Quick Sort	2	30-06-2022 & 02-07-2022		TLM1	
24.	Heap Sort	2	04-07-2022 & 05-07-2022		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: TREES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Introduction to Trees	1	07-07-2022		TLM1	
26.	Binary Trees, Tree Traversals	2	09-07-2022 & 11-07-2022		TLM1	
27.	Binary Trees Implementation	1	12-07-2022		TLM2	
28.	Binary Search Trees	2	14-07-2022 & 16-07-2022		TLM1	
29.	AVL Trees	1	18-07-2022		TLM1	
30.	Operations & Examples	2	19-07-2022 & 21-07-2022		TLM1	
No. of classes required to complete UNIT-IV: 09				**No. of classes taken:**		

UNIT-V: GRAPHS & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	GRAPHS, FUNDAMENTALS	1	23-07-2022		TLM1	
32.	REPRESENTATION OF GRAPHS	1	25-07-2022		TLM1	
33.	BFS	2	26-07-2022, 28-07-2022		TLM1	
34.	DFS	2	30-07-2022, 01-08-2022		TLM1	
35.	Hashing Introduction,	1	02-08-2022		TLM1	
36.	Hash function, separate Chaining	2	04-08-2022, 06-08-2022		TLM1	
37.	Linear & Quadratic Probing	1	08-08-2022,		TLM1	

38.	Double & Rehasing	1	09-08-2022		TLM2	
39.	Revision	1	11-08-2022		TLM1	
40.	Revision	1	13-08-2022		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. Sudhakar**	**Mr. A. S. R. C. Murthy**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : **Dr. J. Nageswara Rao**
Course Name & Code : CONSTITUTION OF INDIA (20MC01)

L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., CSM., II-Sem., A A.Y: 2021-22

PRE-REQUISITE: Understand the Indian Constitution

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the student to understand the importance of constitution
- To understand the structure of Executive ,Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commision of India
- To Understand the Central and State relation, financial and administrative.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
CO 2	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
CO 3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
CO 4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
CO 5	Learn about Election Commision and the process and about SC,ST,OBC and women.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

T1 Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi

T2 Dr.B.R Ambedkar ,The Constitution of India, Government of India

REFERENCE BOOKS:

R1 Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.

R2 Subash Kashyap, Indian Constitution, National Book Trust.

R3 J.A. Siwach, Dynamics of Indian Government and Politics.

R4 D.C. Gupta, Indian Government and Politics.

R5 H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).

R6 J.C. Johari, Indian Government and Politics Hans.

R7 J.Raj, Indian Government and Politics.

R8 M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.

R9Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

E RESOURCES

1. nptel.ac.in/courses/109104074/8.
2. nptel.ac.in/courses/109104045.
3. nptel.ac.in/courses/101104065.
4. www.hss.iitb.ac.in/en/lecture-details.
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction to Indian Constitution

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
1.	Introduction and Co-Po and Syllabus	1	04-05-2022		TLM2	CO1	T1 / T2	
2.	Constitution meaning and the term	1	10-05-2022		TLM2	CO1	T1 / T2	
3.	Sources and History of Indian Constitution	1	11-05-2022		TLM2	CO1	T1 / T2	
4.	Features-Citizenship, Preamble	1	17-05-2022		TLM2	CO1	T1 / T2	
5.	Fundamental Rights and Duties	1	18-05-2022		TLM2	CO1	T1 / T2	
6.	Directive Principles of State Policy	1	24-05-2022		TLM2	CO1	T1 / T2	
7.	Assignment -I	1	25-05-2022		TLM7	CO1	T1 / T2	
No. of classes required to complete UNIT-I		**7**			**No. of classes taken:**			

UNIT-II: Union Government and its Administration Structure of the Indian Union

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	Union Government structure in India	1	31-05-2022		TLM2	CO2	T1 / T2	
9	Federalism Centre	1	03-06-2022		TLM2	CO2	T1 / T2	
10	State Relationships to the Union	1	04-06-2022		TLM2	CO2	T1 / T2	
11	President Role, Power and Position	1	10-06-2022		TLM2	CO2	T1 / T2	
12	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties	1	11-06-2022		TLM2	CO2	T1 / T2	
13	Lok Sabha,Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	17-06-2022		TLM2	CO2	T1 / T2	
14	Assignment II	1	18-06-2022		TLM7	CO2	T1 / T2	
I MID EXAMINATIONS 20-06-2022 to 25-06-2022								
		7			**No. of classes taken:**			

UNIT-III: State Government and its administration Governor

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15	State Government and its Administration Governor and Role	1	28-06-2022		TLM2 / TLM4	CO3	T1 / T2	
16	Role of Chief Ministers and Council of Ministers	1	29-06-2022		TLM2 / TLM4	CO3	T1 / T2	
17	State Secretariat Functions	1	05-07-2022		TLM2 / TLM4	CO3	T1 / T2	
18	Organisation ,Structure and Functions of State Governments	1	06-07-2022		TLM2 / TLM4	CO3	T1 / T2	
19	Assignment –III	1	12-07-2022		TLM2 / TLM4	CO3	T1 / T2	
No. of classes required to complete UNIT-III		**05**			**No. of classes taken:**			

UNIT-IV: A Local Administration

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
20	A Local Administration	1	13-07-2022		TLM2 / TLM4	CO4	T1 / T2	
21	Role and importance of local administration	1	19-07-2022		TLM2 / TLM4	CO4	T1 / T2	
22	Municipalities –Mayor and Role of Elected Representative	1	20-07-2022		TLM2 / TLM4	CO4	T1 / T2	
23	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles	1	26-07-2022		TLM2 / TLM4	CO4	T1 / T2	
24	Village level-Role of Elected and Appointed officials./Assignment-IV	1	27-07-2022		TLM2/ TLM 7	CO4	T1 / T2	
No. of classes required to complete UNIT-IV		**05**			**No. of classes taken:**			

UNIT-V: Election Commission

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25	Election Commission :Role of Chief Election Commissioner and Election Commisionerate	1	02-08-2022		TLM2 / TLM4	CO5	T1 / T2	
26	State Election Commission	1	03-08-2022		TLM2 / TLM4	CO5	T1 / T2	
27	Functions and Commissions for the Welfare of SC/ST/OBC and Women.	1	10-08-2022		TLM2 / TLM4	CO5	T1 / T2	
No. of classes required to complete UNIT-V		**03**			**No. of classes taken:**			

Content Beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Consumer Rights Industrial policies	1	13.08.2022		TLM2/ TLM5		T2/R3	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project
TLM 7	Assignment /Quiz		

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5
I-Mid Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	**Programming Paradigms:**The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 2	**Data Engineering:**To inculcate an ability to analyze, design and implement database applications.
PSO 3	**Software Engineering:**The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr J Nageswara Rao	K.Ravi Kiran Yasaswi	Dr.D.Veeraiah	Dr.D.Veeraiah

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.Jamili Reddy
Course Name & Code **:** Engineering Chemistry Lab&20FE53
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/IIsem/CSE(AI&ML)-A **A.Y. :** 2020-22

Pre requisites: Nil

Course Educational Objective: This course enables the students to analyze water sample for alkalinity. perform and distinguish different types of volumetric titrations. get hands-on experience with preparation of polymers. use analytical techniques like conductometry, potentiometry and colorimetry.

Course Outcomes: After completion of the course, the students will be able to,
CO1: Assess alkalinity of water based on the procedure given.
CO2: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.
CO3: Acquire practical knowledge related to preparation of polymers.
CO4: Exhibit skills in performing experiments based on theoretical fundamentals.

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1		2	2					
CO2	2	1										
CO3	2		1									
CO4	3	2	1									
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

Bos Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Engineering chemistry lab	3	05-05-2022		TLM1	CO4	
2.	Determination of amount of HCl using standard Na_2CO_3 solution	3	12-05-2022		TLM4	CO2,CO4	
3.	Determination of alkalinity of water sample.	3	19-05-2022		TLM4	CO1,CO4	
4.	Estimation of Mg+2/Zn+2/Ca+2 in given solution by using standard EDTA solution.	3	26-05-2022		TLM4	CO2, CO4	
5.	Preparation of nylon fibres.	3	02-06-2022		TLM4	CO3	
6.	Preparation of Bakelite	3	09-06-2022		TLM4	CO3	
7.	Estimation of Mohr's salt by using potassium permanganate.	3	16-06-2022		TLM4	CO2	
8.	Estimation of ferrous ion by using potassium dichromate.	3	30-06-2022		TLM4	CO2	
9.	Determination of pH of the given sample solution using pH meter	3	07-07-2022		TLM4	CO4	
10.	Estimation of amount of HCl conductometrically using standard NaOH solution.	3	14-07-2022		TLM4	CO2,CO4	
11.	Estimation of amount of HCl conductometrically using NH4OH solution.	3	21-07-2022		TLM4	CO2,CO4	
12.	Estimation of amount of HCl potentiometrically using NaOH solution.	3	28-08-2022		TLM4	CO2, CO4	

13.	Determination of Iron by a Colorimetric method using thiocynate as a reagent.		04-08-2022			C02, CO4	
14.	Internal lab exam	3	11-08-2022				
Total							

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

Part - C

EVALUATION PROCESS:

According to Academic Regulations of R20 Distribution and Weightage of Marks For Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Parameter		**Marks**
Day – to – Day Work	Observation	05 Marks
	Record	05 Marks
Internal Test		05 Marks
Total		**15 Marks**

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.K.Jamili Reddy**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : T N V S PRAVEEN
Course Name & Code : Python Programming Lab (20CS54)
L-T-P Structure : 0-0-3 Credits : 1.5
Program/Sem/Sec : B.Tech., CSM., II-Sem., A A.Y : 2021-22

PRE-REQUISITE : C Programming

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Apply building blocks of Python in solving computational problems. (Apply - L3)
CO 2	Implement in-built data structures available in Python to solve computational problems. (Apply - L3)
CO 3	Implement modular programming, string manipulations and Object-oriented programming in python. (Apply - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	-	-	-	-	-	-	-	3	-	-
CO2	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO3	-	3	2	3	2	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**

1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

PART-B

Introduction: Language basics and example problems (Two weeks)

a) Implement Python Script for checking the given year is leap year or not.
b) Implement Python Script for finding biggest number among 3 numbers.
c) Implement Python Script for displaying reversal of a number.
d) Implement Python Script to check given number is Armstrong or not.
e) Implement Python Script to print sum of N natural numbers.
f) Implement Python Script to check given number is palindrome or not.
g) Implement Python script to print factorial of a number.
h) Implement Python Script to print all prime numbers within the given range.
i) Implement Python Script to calculate the series: S=1+x+x2+x3+.....xn
j) Implement Python Script to print the following pattern:

```
*
* *
* * *
```

Modue 1: Exercise Programs on Lists.

a) Write a Python script to display elements of list in reverse order.
b) Write a Python script to find the minimum and maximum elements without using built-in operations in the lists.
c) Write a Python script to remove duplicates from a list.
d) Write a Python script to append a list to the second list.
e) Write a Python script to count the number of strings in a list where the string length is 2 or more.

Module 2: Exercise Programs on Tuples.

a) Write a Python script to create a tuple with different data types.
b) Write a Python script to find the repeated items of a tuple.
c) Write a Python script to replace last value of tuples in a list.
   Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]
   Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]
d) Write a Python script to sort a tuple by its float element.
   Sample data: [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]
   Expected Output: [('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]

Module 3: Exercise Programs on Sets.

a) Write a Python script to add member(s) in a set.

b) Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.
c) Write Python script to test whether every element in S is in T and every element in T is in S.

Module 4: Exercise Programs on Dictionaries

a) Write a Python script to sort (ascending and descending) a dictionary by value.
b) Write a Python script to check whether a given key already exists or not in a dictionary.
c) Write a Python script to concatenate following dictionaries to create a new one.
Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}
Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
d) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
e) Write a Python program to map two lists into a dictionary.

Module 5: Exercise Programs on functions and recursion.

a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between given range X and Y.
c) Define functions to find mean, median, mode for the given numbers in a list.
d) Define a function which generates Fibonacci series up to n numbers.
e) Implement a python script for factorial of number by using recursion.
f) Implement a python script to find GCD of given two numbers using recursion.

Module 6: Exercise programs on Date and Time Modules.

a) Write a Python script to get the current time in Python.
b) Write a Python script to get current time in milliseconds in Python
c) Write a Python script to print next 5 days starting from today.

Module 7. Exercise programs on Exception Handling.

a) Write a Python script to handle simple errors by using exception handling mechanism.
b) Write a Python script to handle multiple errors with one except statement.

Module 8: Exercise programs on Strings

a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.
c) Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.

d) Implement python script that takes a list of words and returns the length of the longest one.

Module 9: Exercise programs on Regular Expressions

a) Write a Python script to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9).

b) Write a Python script to check whether password is valid or not.

Conditions for a valid password are:

Should have at least one number.

Should have at least one uppercase and one lowercase character.

Should have at least one special symbol.

Should be between 6 to 20 characters long.

Module 10: Exercise programs on Object Oriented Programming

a) Write a Python script to create and access class variables and methods.

b) Write a Python script to implement method overloading.

c) Write a Python script to implement single inheritance.

d) Write a Python script to implement method overriding.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Installation and Working on Interpreter	3	06.05.2022		TLM4	CO1,CO4	
2.	Language Basics and Example Programs	3	13.05.2022		TLM4	CO1,CO4	
3.	Language Basics and Example Programs	3	20.05.2022		TLM4	CO1,CO4	
4.	Module-1 Programs on Lists	3	27.05.2022		TLM4	CO2,CO4	
5.	Module-2 Programs on Tuples	3	03.06.2022		TLM4	CO2,CO4	
6.	Module-3 & 4 Programs on Sets Programs on Dictionaries	3	10.06.2022		TLM4	CO2,CO4	
7.	Module-5 Programs on Functions & Recursions	3	01.07.2022		TLM4	CO3,CO4	
8.	Module-6 Programs on Modules	3	08.07.2022		TLM4	CO3,CO4	
9.	Module-7 Programs on Exception Handling	3	22.07.2022		TLM4	CO3,CO4	
10.	Module-8 Programs on Strings	3	29.07.2021		TLM4	CO3,CO4	

11.	Module-9 Programs on Regular Expressions	3	06.08.2022		TLM4	CO3,CO4	
12.	Module-10 Programs on OOP	3	13.08.2022		TLM4	CO3,CO4	
13.	Internal Lab Exam	3	20.08.2022				

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. T.N.V.S Praveen**	**Dr. M. Srinivasa Rao**	**Dr. Y. V. Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING(AI&ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: **A. Sudhakar**

Course Name & Code **: DATA STRUCTURES LAB & 20CS53**

L-T-P Structure **: 0-0-3** **Credits:** 1.5

Program/Sem/Sec : B.Tech/II/A **A.Y.:** 2021-22

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques

COURSE OUTCOMES (CO):

CO1: Implement Linear Data Structures using array and Linked list. (**Apply - L3**)

CO2: Implement Various Sorting Techniques. (**Apply - L3**)

CO3: : Implement Non-Linear Data Structure such as Trees &Graphs. (**Apply - L3**)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1		2	1		1										
CO2		2	1		1										
CO3		2	1		1										
CO4								2	2	2					

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction & List using Arrays	3	02-05-2022		
2.	Linked List Programs	12	09-05-2022 16-05-2022 23-05-2022 30-06-2022		
3.	Stack, Queue Using Arrays, Linked List	6	06-06-2022 13-06-2022		
4.	Infix to Postfix, Evaluation of Postfix Expression	3	20-06-2022		
5.	Circular Queue Double Ended Queue	3	27-06-2022		
6.	Bubble sort Selection sort Insertion sort	3	04-07-2022		
7.	Merge sort Quick sort	3	11-07-2022		
8.	Heap sort Binary Tree	3	18-07-2022		
9.	Binary Search Tree	3	25-07-2022		
10.	BFS,DFS	3	01-08-20222		
11.	Lab Internal Exam	3	08-08-2022		

PART-C

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. Sudhakar**	**Mr. A. S. R. C. Murthy**	**Dr. Y.V. B. Reddy**	**Dr. D. Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.MD.AMANATULLA
Course Name & Code : SHELL SCRIPTING LAB & 20CS55
L-T-P Structure : 0-0-2 Credits : 1
Program/Sem/Sec : B.Tech., AI&ML., II-Sem., A.Y : 2021-22

PRE-REQUISITES : Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to familiarize with the Unix/Linux command line and running simple commands and concept of environment variables and with the simple use of environment variables.

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO 1	Understand the basic Unix/Linux commands.
CO 2	Learn importance of shell scripting.
CO 3	Apply shell programming to various files.
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	-	2	3	-	-
CO2	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO3	3	2	3	1	-	-	-	-	-	-	-	2	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

REFERENCE BOOKS:

R1 Learning the bash Shell, 3rd Edition by Cameron Newham, Publisher(s): O'Reilly Media, Inc., ISBN: 9780596009656

R2 UNIX and Shell Programming by Behrouz A. Forouzan, Richard F. GilbergPublisher: Thomson Press (India) Ltd, ISBN: 9788131503256, 9788131503256

R3 Shell Scripting: Expert Recipes for Linux, Bash, and More by Steve Parke

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - C

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**Module – I:** Basic Linux Command -Introduction to Operating systems, Features of Unix/Linux kernel and shell	2	03-05-2022		
2.	study of vi editor ,Unix/Linux file systems, Unix/Linux Commands (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date)	2	10-05-2022		
3.	Unix/Linux Commands (time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) 1.Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep,dd, dfspace, du, ulimit	2	17-05-2022		
4.	**Module–II: Introduction to Shell-** Introduction to Shell, Shell responsibilities, running a shell script, Variables, passing arguments,Basic Operators	2	24-05-2022		
5.	Decision Making, Loops, Arrays, Arrays –Comparison, Shell functions.	2	31-05-2022		
6.	Shell Programming: Shell script exercises based on following: (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif case structure (vii) while, until, for loops, use of break	2	07-06-2022		
7.	**Module – III:** Advanced Shell Special Variables, Bash trap command, File Testing, Input Parameter Parsing.	2	14-06-2022		
8.	Pipelines, Process Substitution, Regular Expressions, Special Commands: sed, awk, grep, sort.	2	28-06-2022		
9.	Commands related to inode, I/O redirection and piping, process		05-07-2022		

	control commands, mails.	2			
10.	Write a shell script to create a file. Follow the instructions (i) Input a page profile to yourself, copy it into other existing file (ii) Start printing file at certain line (iii) Print all the difference between two file, copy the two files. (iv) Print lines matching certain word pattern	2	12-07-2022		
11.	Write shell script for- (i) Showing the count of users logged in, (ii) Printing Column list of files in your home directory (iii) Listing your job with below normal priority (IV) Continue running your job after logging out.	2	19-07-2022		
12.	Write a shell script to change data format. Show the time taken in execution of this script. Write a shell script to print files names in a directory showing date of creation & serial number of the file. Write a shell script to count lines, words, and characters in its input (do not use wc).	2	26-07-2022		
13.	Lab Internal Exam	2	02-08-2022		

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
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Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
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